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THE PEDIATRICIAN AND THE SECTION ON DISEASES OF CHILDREN*

LAWRENCE T. ROYSTER, M.D.

NORFOLK, VA.

We stand today at the threshold of a new era of medical knowledge. But a few years have passed since anatomy was the only branch of medicine which was based on accurate observation and proved fact; physiology and histology were studied almost entirely from a hypothetic standpoint; obstetrics was practiced even among the well-to-do largely by ignorant "grannies," with disastrous results to both mother and child. Minor surgery was attempted early, but, because of the ignorance of the causes of sepsis, the results were often as fatal as the condition for which the operation was performed; while therapeutics was practiced with an empiricism comparable with the fetish of the aboriginal tribal medicine man. All of this was primitive indeed, and yet what is rapidly being recognized as the most important branch of medicine, pediatrics, was practically unknown. A sick child was the *bête noire* of the physician, who either guessed at the cause of symptoms and consequently treated them in a haphazard fashion or promptly turned the unfortunate patient over to the tender mercies of a grandmother, who was supposed to know much about the ailments of children because she had had eight or ten of her own, despite the fact that only one or two had survived infancy.

During this period, the teaching of pediatrics was almost nil, mere mention being made of children and their ailments during the course of lectures on obstetrics or general medicine. This was the case merely because little or no study had been given to the infant physiology and pathology; consequently, since nothing was known, nothing could be taught. But times are fortunately changing. Our knowledge of physiology, while far from what is to be desired, is based on careful experiment conducted scientifically in endowed laboratories. The result of such study is far reaching and revolutionizing. Histology has won a place at the head of the exact sciences and surgery has reached such a degree of efficiency that he who practices it appears almost a wizard. The practice of obstetrics has not advanced so notably, so far as technic is concerned, but through the application of the principles of asepsis, the life and health of both patients are much better safeguarded. Therapeutics has passed from the ignorant guesswork of the alchemist, through the consequent period of skepticism, to a definite and logical position, largely through the application of rational laws of biochemistry and the knowledge of the interaction of the internal secretions. In this general transmutation of knowledge the child has not been lost sight of. Pediatrics has evolved into a study of seriousness, dignity and importance. The public as well as the profession is awakening to the hitherto undreamed of importance of its careful study, and I think I can state without a single challenge that the study of child life is the most important of the allied medical branches.

It is a far call from the "old woman" of a generation ago to the pediatrician of today. Of necessity he must be an all-round specialist, so far as his knowledge goes, limiting his efforts merely by the age of the patient. In the broadest sense, what must be the equipment of the pediatrician? Primarily, as all medical men, he should be possessed of a liberal general education. He must have a medical education in keeping with the highest standards of today.

The attendants in the best general hospitals are usually men of the highest culture, and from them must come most of the student's inspiration. The training of such a hospital is all but indispensable, while the special knowledge gained by an internship in a children's hospital is a sine qua non. Thus alone can he acquire the necessary acquaintance with the principles and problems of general medicine. He should also possess a surgical training which will acquaint him with those diseases usually classed as "surgical," their diagnosis and the indications for operation, and since biology and biochemistry are fundamentals in any branch of medicine, the microscope must be his constant companion. Through an intimate knowledge of infectious diseases alone may he become the sanitarian which is required, for pediatrics has well been called the "national preventive medicine."

These in brief must constitute his equipment from the standpoint of technical education—but he must not stop there. He must be a leader of thought in his community, not confining this leadership to the members of his profession, but, going further, must establish his position "speaking as one having authority" on all matters pertaining to child welfare, for the practice of pediatrics goes further than the mere diagnosing and treatment of diseased conditions, it must deal more and more with the prevention of disease as well. To this end the influence of the pediatrician should be felt in the boards of education, the council chamber and in all sociologic endeavor. Do I hint that the pediatrician must be a politician? Yes and no. Not the politician who seeks leadership

* Chairman's address, read before the Section on Diseases of Children at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

for personal gain, but rather that leadership which "vaunteth not itself," seeks no preferment, nor accepts pecuniary reward. That leadership which, through self-sacrifice, backed by the requisite knowledge, makes him so respected and trusted that his views may be accepted and the principles he advocates applied. Nowhere are such men so needed as on boards of education. Our school buildings are frequently insanitary in the extreme, ventilation and lighting are both inadequate, while the mind of the average child, for whom the public school systems of necessity exist, is frequently taxed to a dangerous degree. The health of a community depends on the health of its children. As the health—physical, mental and moral—of the schoolchild is safeguarded, so the health of the community is conserved.

In the council chamber? Most emphatically, *yes*. One has but to glance casually over the ordinances of any community to see their utter futility from a health standpoint. Fortunately, the modern tendency is to permit the rules of the board of health to be law. But these rules do not generally include the direction of building and construction. This is usually unnecessary for the better class of dwellings, but only a short trip through the tenement district of any city will disclose insanitary conditions which, if realized by the public at large, would cause a panic. Are we our brother's keeper? We are. But if we have not an altruistic spirit, if we are impelled only by the baser motive, self-protection, we have but to remember that from the homes of the poor come our servants who prepare our food and nurse our children. Does not the pediatrician then owe his influence in stamping out tuberculosis and moral disease in a community to the children of both rich and poor? What a power one man with knowledge can be, on an official board, in improving insanitary housing conditions.

From the settlement home, one of the expressions of that newer religion, sociology, have come some of the most valuable suggestions to our profession. The "follow-up" work done by district visiting nurses and trained social workers has done more to ferret out the reasons for the spread of disease and to stamp out certain diseases than almost any other single agency; and to none has this been of more benefit than to the child; hence, the need of the knowledge and counsel of the trained pediatrician on the advisory boards of such institutions. A thorough knowledge of sociology is perhaps of more importance to the study of pediatrics than almost any other branch of information.

But the pediatrician must go even further still. He must acquaint himself with the more recent investigations, particularly in the field of heredity. Many of these studies are based as yet on hypothesis alone and lack tangible proof, but it must be remembered that most great scientific truths have been conceived in the minds of great thinkers as hypotheses long before they became proved fact.

Many diseases and conditions which were formerly considered directly inherited have been proved to be acquired during the prenatal state, and although they have been transmitted directly from mother to offspring while in utero, they are none the less acquired and not inherited. Therefore a sharp distinction must be made between inheritance and the influence of prenatal environment. We are aided in making this distinction by certain biologic investigation which has suggested if not proved that no disease is transmitted from mother to child unless there be a solution of continuity in the chorionic villi; and by the epoch-making discoveries of Gregor Mendel in fixing definite laws of heredity.

The transmission of physical characteristics and moral traits from generation to generation has been understood only since the introduction of the theory of "cell determinors" which is best explained through the hypothesis of "intracellular pangenesis" of Hugo DeVries, while certain other phenomena of character and temperament can be explained satisfactorily only by the "mechanistic theory of evolution." To quote Crile on this subject: "Man is a unified mechanism responding in every part to the adequate stimuli given it from without by the environment of the present and from within by the environment of the past, the record of which is stored in part in cells throughout the mechanism but especially in its central battery—the brain." These latter apply very forcibly to mental conditions; that is, normal, supernormal and subnormal, but especially the last, for we recognize that a child who is even slightly subnormal mentally is always less resistant to disease as well as unable to acquire knowledge. Thus it will be seen that the pediatrician must also be an alienist. This is particularly necessary at present, when there appears to be an ever increasing number of these cases coming under our notice.

Only through constant study and frequent postgraduate work can the pediatrician keep fully abreast of the best thought. Those of us who live distant from the large centers of teaching must make frequent visits to these centers and receive instruction from those possessing the facilities for scientific work. Shorter courses of postgraduate work, however, may well be taken in attendance on local, state or national societies, all of which should be considered in this light, and for the pediatrician the Section on Diseases of Children should be of great benefit. What, then, are the opportunities and duty of this section?

This section should be the clearing house for this country of the best work done each year in pediatrics. Affiliated with it are all of the leading pediatricians of America and most of those general practitioners who are particularly interested in disease as manifested during childhood. The papers read before this section should constitute the best course of lectures obtainable and must be so selected that an ever increasing number should feel impelled to attend the sections even at the cost of personal sacrifice. To further this aim a symposium might be arranged for each session led by some invited guest of such reputation that a good attendance may be assured. The utterances of the section as a whole should eventually become authoritative to the general public as well as the profession. The best papers should be selected for pamphlet distribution and even to a limited extent be given publicity through the daily press. To accomplish anything in this direction there must be established a careful censorship of all material so that nothing but sound advice and proved fact would be disseminated.

A committee from this body could well cooperate with organizations such as the Child Welfare Bureau of the federal government, the American Association for the Study and Prevention of Infant Mortality, the U. S. Public Health Service and state boards of health in studying the causes of infant mortality and

aid in their prevention.[1] Perhaps the American Medical Association might even see fit to establish a council on infant mortality and morbidity analogous to the other councils which have done such excellent work in their several fields of endeavor. Such a council could issue bulletins advocating certain procedures and broad principles and condemning unwarranted practices; or direct the agencies for child welfare in a manner which is not only suggestive but even authoritative. Thus could its influence be felt in a forceful and useful manner.

One of the greatest duties of this section is the development of the many efficient but little-known men throughout the country into writers of papers and educators of the public. To this end every effort should be put forth to insure the attendance on the sessions of the section of the 1,500 or more who, according to the information in the American Medical Association Directory, either practice pediatrics exclusively or re particularly interested in this branch, instead of the small average of 150 as at present. Our very efficient secretary has made an excellent start this year in sending out an invitation to a thousand to participate in this session and I think this is a start in the right direction which should be continued year by year.

Have I placed an ideal for the pediatrician and this section of this association too high? I think not. We follow a noble calling in the profession of medicine; we study particularly the most important part of the race; we are striving through such study to make the race better physically and to place its members in a position where they can be important members of the human family and not weaklings. Any body of men which has these for its aims cannot have too high an ideal of equipment and service.

205 Taylor Building.

STARCH DIGESTION IN CHILDREN

WITH SOME CLINICAL OBSERVATIONS *

H. H. YERINGTON, M.D.
AND
CLYDE T. WETMORE, M.D.
SAN FRANCISCO

During the past few years many articles have appeared in the literature concerning the ability of both the infant and child to digest starch. A great deal has been added to our knowledge in regard to starch digestion in infants under a year of age, but few have dealt with the subject in children past infancy. It is our object to review the literature briefly and bring to notice some clinical observations we have made in the study of cases of the latter type.

Of the three different foodstuffs, namely, protein, fat and carbohydrates, which are ingested for the supply of energy, heat and tissue building, the carbohydrates will occupy by far the largest bulk, and if the various kinds of food classified under carbohydrates be compared it is found further that the greater percentage is ingested in a form which necessitates greater chemical action in its preparation for absorption and assimilation than is required by any of the other members of this group. This form constitutes the starches, whose chemical analysis classifies them as polysaccharids and whose properties are very different from those of the simpler members of this large group.

In order that this more complex form of raw material may be utilized in the body it is necessary that it, like all other forms of food, undergo a change, a breaking down into simpler bodies. This alteration is brought about by the hydrolytic action of certain ferments, which are present in the digestive juices found in the course of the alimentary canal. Considering starch only, we find that by the action of the salivary and pancreatic juices, this substance is converted into dextrin and finally into maltose by the ferment maltase.

In working with these ferments it has been found that they are affected by different conditions; thus the velocity is increased by heat up to a certain point, at which a destruction of the ferment will occur. The introduction of a foreign body will in many cases cause a permanent or transitory inactivation of the ferment.

The digestion of starch commences in the mouth by the action on it of saliva, which contains the two ferments amylase and maltase. The former of these ferments acts on starch, converting it through the various stages of dextrins into maltose.

By the action, then, of maltase, maltose is converted into the more diffusible carbohydrate, glucose. All starches are found to be susceptible to the action of amylase although raw starches are very slowly hydrolyzed.

As human saliva is rich in ferments the large bulk of food entering the mouth should be properly and thoroughly masticated. Thus is seen the importance of teaching the child the advisability of this procedure.

It is important to consider here what action a foreign body has in inhibiting the action of the salivary ferments; thus far little work has been done to ascertain the inhibitory effect which stomatitis, infected tonsils and carious teeth produce.

By far the greater portion of amylaceous foods are attacked after leaving the stomach by the ferments of the pancreatic juice and the succus entericus, and it is interesting to note that if the ferments were entirely absent from the intestinal canal many of the carbohydrates would be capable of being absorbed from the intestines through the action of the cells of the mucosa in converting various sugars to glucose.

The action of the ferments on the carbohydrate continues ordinarily down the alimentary canal so long as any unchanged portion remains; finally the acidity present in the lower bowel becomes sufficient to inhibit or destroy the activating agent. Any portion still remaining unchanged is very liable to fermentation from bacterial action.

The question of the ability of the infant and newborn babe to digest starch has occupied the attention of physiologists and physicians for many years. Forty-four years ago Schiffer, and forty years ago Jacobi, demonstrated that the saliva of the new-born was capable of converting a small quantity of starch to sugar. In 1908 Friedlander in Cincinnati carried on a series of bead experiments in infants of all ages to ascertain the digestibility of various foodstuffs. About this time

1. The Virginia State Board of Health sends a specially prepared bulletin on the care of infants to the mother of every child whose birth certificate is filed in that office.

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* From the Department of Pediatrics, Leland Stanford Jr. University, School of Medicine.

Solera and Malay worked on the comparative digestibility of different carbohydrates and showed that the action of the ferments was dependent on the degree of "soluble starch" formed by previous preparation.

In 1912 Hess experimented on pancreatic ferments obtained by the use of the duodenal catheter, showing that amylase was present in infants 12 hours old, increasing greatly in quantity after the first month. Czerny and Kellar were the first to study the ill effects of the prolonged use of starch without the addition of milk and gave us a classification of this condition.

Finkelstein believes too much carbohydrate in the form of sugar has an irritating effect on the mucosa of the stomach and intestines, producing increased peristalsis and diarrhea and interfering with absorption and assimilation.

Hesenius concluded from observations he made that 90 per cent. of the starch given by mouth disappears and that not more than 10 per cent. is recoverable from the feces; he does not assume that this large percentage is digested and absorbed, for the element of bacterial fermentation invariably plays a large rôle in the destruction of undigested starch.

Cammidge states that the digestibility of starch is largely dependent on the way in which it is prepared and cooked. Raw wheat-meal is more rapidly assimilated than raw potato starch, but when the potato has been thoroughly cooked the difference is not nearly so marked. In chronic gastro-intestinal disturbances the absorption and digestion of starch is interfered with so that its use should be carefully regulated and controlled by a microscopic and chemical examination of the stools. Vegetables are better tolerated than bread, potato, rice and simple starchy foods.

During the past four or five years in the outpatient clinic of the division of pediatrics at the Stanford medical school, a routine examination of the urine and stools has been made in the majority of cases, especially in those showing any intestinal trouble, and in all the cases which have been examined for tonsil and adenoid operations. We have observed that there is a certain type of child whose dietary is made up principally of carbohydrates and a low protein content. Their stools show an excess of undigested starch and they are listed on our index cards as the "starch-type of intestinal indigeston."

As far back as 1868 Eustace Smith of London described a series of cases of this type in younger children which he called "mucous disease" and advised the exclusion of starchy foods and the examination of the stools.

Cautley described a condition which he called "carbohydrate fever" in children having more or less digestive disturbance, liability to recurrence and no apparent origin. He thought the condition was produced by an excess of carbohydrate, combined with a deficiency of proteins and that a catarrhal condition of the alimentary tract was set up, varying in severity.

In 1911 Porter, after studying a great number of these cases, read a paper before the California State Medical Society in which he described cases in which the child showed partial or complete inability to digest starches properly. In the former cases the child often presented an urticaria, showed no gain in weight, had an enuresis, especially at night, and was very restless. In the more marked type in which the starch was not split up in the intestines, the child developed a clinical picture not unlike a long-persisting bacterial infection, with brown mucous stools, loss in weight and a large, distended abdomen.

It has been our custom in these cases to make the parents write out a four-day dietary consisting of the food the child has been having, with the quantity and hour of feeding tabulated. During this time the stool would be obtained before any treatment or change in diet began. A sample day's dietary usually ran as follows:

8:30 a. m.—Orange juice, mush and milk, hot cakes.
10 a. m.—Piece of bread and butter.
12:30 a. m.—Sliced tomatoes, baked potato, apple sauce glass of milk, bread and butter.
3 p. m.—Bread and jelly.
6 p. m.—Plate of soup, bread and butter.

In the great majority of these dietaries eggs and meat were not given, and bread, jelly, and cakes were invariably given between meals.

With such a dietary, extending over a long period of time, we would expect to find an excess of undigested starch in the stool, and in the case of an intestinal upset with diarrhea, the greater portion of the starchy food would come through the intestine with practically no splitting; this we found true, and such cases presented the distended abdomen, loss of weight, restlessness and the possible urticaria described above.

After studying this type of case we were anxious to know that percentage of starch appeared in the stools of children in fairly normal condition and on a fairly rational dietary. As it was impossible to obtain stools on a large series of children outside of the clinic, a series of fairly normal clinical cases was selected.

Our original series of observations consisted of a tabulation of 372 stool analyses from 338 children ranging from 1 to 14 years of age. The diagnoses were varied and consisted of:

Hypertrophied tonsils	267
Digestive disturbances (disturbances throughout the alimentary tract)	41
Enuresis	10
Rickets	6
Other conditions (bronchitis, eczema, jaundice, etc.)	14

GRADED AMOUNT OF STARCH AND FOOD REMAINS PRESENT IN THREE HUNDRED AND SEVENTY-TWO STOOLS IN CASES WITH DIFFERENT DIAGNOSES*

Condition	Amount of Food Remains								Amount of Starch							
	None		Small		Large		Excess		None		Small		Large		Excess	
	Stools	%	Stools	%	Stools	%	Stools	%	Stools	%	Stools	%	Stools	%	Stools	%
Hypertr. tonsils	38	13.5	112	39.8	109	38.7	22	8	92	32.7	103	36.6	53	18.8	33	11.9
Digest. disturb.	11	28.9	19	50	5	13.1	3	8	13	23.6	23	41.8	10	18.1	9	16.5
Enuresis	3	27.2	5	45.4	2	18.1	1	9	1	9.1	7	63.6	2	18.1	1	9.2
Rickets	4	57.1	3	42.9	0	0	3	42.8	2	28.5	1	14.2	0	0.0	1	14.5
Other conditions	4	22.2	8	44.4	6	33.4	0	0	7	38.8	7	38.8	2	11.2	2	11.2

* For example, of the stools in cases in which there was hypertrophy of the tonsils, thirty-eight stools, or 13.5 per cent., contained no food remains.

The examination of the stools was made in the clinical laboratory of Lane Hospital, on the same day the stools were passed; this consisted of the microscopic examination of smears stained with Lugol's solution, which stains the starch granules a characteristic dark blue. The amount of food remains was also tabulated for comparison.

These examinations were done under the supervision of one man and for practical purposes was the best method we could follow.

From the table it will be seen that the greatest percentage of excess starch occurs in digestive disturbances, namely, 16.5 per cent., and next is rickets with 14.5 per cent. In considering the tonsils cases, in which we have an excess in 11.9 per cent., I wish to bring out a few points:

First, in 232 of these cases in which the teeth conditions were mentioned in our histories, seventy-six children showed one or more decayed teeth.

Second, the majority of these children had chronically inflamed tonsils, with repeated attacks of tonsillitis.

Third, the reports on the dietaries of this series of cases showed that nearly all of them were fed over a long period of time on a diet rich in starchy food.

Granting the statement of Cammidge that some starch is always found in the feces of infants and children, we feel that the percentage of cases containing much and excess starch (30.7 per cent.) as calculated in the series of hypertrophied tonsils is unusually high.

At a later date it may be possible to submit a tabulation of stools taken from normal children, but this is not possible at present.

We feel after making these examinations and studying cases and dietaries that the following conclusions are worth bringing before you:

1. There is a type of indigestion in children presenting certain clinical manifestations brought on by the continued use of a diet composed principally of carbohydrates.

2. This condition can be cured by eliminating the starches somewhat and giving a mixed diet fed at proper intervals.

3. The successful treatment of these patients cannot be accomplished without giving the parents a written dietary, containing the nature and quantity of the articles to be given and the time of meals.

4. Frequent examination of the stools is absolutely necessary to aid in the diagnosis and check up the progress of the case.

5. Before attempting to correct the dietary errors the oral cavity should be carefully examined, as the presence of carious teeth, chronically inflamed tonsils and nasal secretions play a most important part in the proper digestion of the child's food.

240 Stockton Street.

ABSTRACT OF DISCUSSION

DR. F. W. SCHLUTZ, Minneapolis: I would like to ask Dr. Yerington whether many of his patients showed marked skin manifestations; for example, eczema, and whether he noticed any greater tendencies to a catarrhal type of stool in these cases? Many of his cases apparently had hypertrophy of the tonsils. There is a disposition at present to interpret all these phenomena as expressions of a peculiar constitution. Possibly increased peristalsis would have some influence on the starch digestion.

DR. H. D. CHAPIN, New York: I take exception to the statements regarding barley water. Some years ago Dr. Jacobi pointed out that cereal water was exceedingly good as an addition to an infant's food. Its use became popular and it seemed to yield remarkably good results. Then the percentage method of feeding came into vogue and we were taught that it was important to get the percentage of all the food elements, proteins, fats and carbohydrates, in the same proportion as they were found in woman's milk, and we were taught that cereal decoctions were anathema—not at all scientific. It was observed also that those who were using cereal decoctions were getting the best results. So we experimented on dogs and other animals and found that the addition of a little starch made the protein more easily digestible and acted as a good attenuant to casein. As to the practical side of the question, one found it most humiliating, after having attempted to feed an infant according to accepted scientific principles without success, to have the parents go to the corner drug store, get a proprietary food for the infant and find that the baby fattened up in a short time. It is asserted that barley water is not found in mother's milk, but it is also true that the casein of cow's milk is not found in mother's milk. We must study this subject from the same standpoint and in the same way as we study science at large, and we must get the profession to look at the subject in the same way as they look at science at large. I have no sympathy with much that has been taught on the subject of infant feeding. The subject has become so complicated that the student and the general practitioner throw up their hands when they undertake to grapple with it. Each man has a method of his own which no one else can understand and which he himself sometimes forgets. We have been going from one extreme to the other and it is well to have the subject threshed out. We know that there are no cereals in mother's milk, but the casein of mother's milk coagulates differently from that of cow's milk and the cereal decoctions affect the coagulation. The proteins in the milk of different mammals all coagulate in a different way because they have a developmental as well as a nutritional value. Take the ruminant herbivora and we find that the casein coagulates in lumps which are intended to develop the motility of the animal's stomach, because the animal must feed on grass, grains, etc., and the stomach must be prepared to deal with them. In the milk of nonruminant animals the casein coagulates in soft, flocculent, jelly-like coagula which will pass out of the stomach easily. We find the protein of mother's milk midway between that of cow's milk and that of the nonruminant animals. The enzymes act only by contact, and if they can get at the food elements they act with enormous power, and by adding starch the proteins are broken up into smaller particles exposing a greater surface to the action of the enzymes and are more easily digested. We should study this subject from the practical standpoint and find out what agrees with the baby and then find the scientific reason for its use.

DR. C. G. GRULEE, Chicago: My views are identical with those expressed by Dr. Chapin. I cannot agree with the ideas just expressed in the paper, for digested starch is changed into sugar, and if the starch is not changed into sugar it goes through the digestive tract undigested and acts like a foreign body. In my opinion, barley water as a diluent does no harm.

DR. L. PORTER, San Francisco: It is our practice to make a routine examination of the stools of every infant that comes in merely as a matter of interest and with the possibility in view that we may learn something. When starch is present in large quantities its elimination is always accompanied by symptoms of indigestion, and we find that these clear up following the withdrawal of starch. This seems to show that the disturbance is due to an intolerance of starch. A number of children during the second and third years of life present digestive disturbances due to starch indigestion, but we seem to have concentrated our attention on barley water. Dr. Northrup has given us the touchstone for the solution of these problems in the alliterative expression "feedings to fit." If we could put this up over every doctor's desk we

would accomplish more than by discussion. Some babies digest starch and some do not, and barley water does not agree with a large number of children in the first few weeks of life. Dr. Chapin's point was well taken that by breaking up the gluten a larger surface is exposed, and that if it is finely divided a large surface is created which can be acted on. There are many babies in the second year who cannot digest potato, and we call these potato babies. They have stomach ache and pain referred to the umbilicus, and examination of the stools shows the presence of starch in capsules. If we take the potato away from the diet of the child the stomach aches cease. This is not scientific, but it is a truth. The same babies may later be able to digest potato well. Furthermore, there are different kinds of potatoes, and the way in which they are cooked makes a great difference. There are the old sodden, soggy potatoes that are not good, and new potatoes are not so well taken care of. Then there are old potatoes that are better suited to children. Children who have difficulty in digesting potato may be helped by substituting rice. Another point which Wallace has brought out is that children with bad molar teeth are apt to have starch indigestion because the starchy foods are not properly broken up and become like a foreign body in the digestive tract. It seems a little strange to object to bread, but in babies 1, 2 or 3 years old the bread gets into large masses and there is not a proper surface area exposed and it does not get split up. It is better to give hard crackers or zwieback, since eating these hard foods teaches the child to chew, and this is important in developing the teeth and jaws. I think we should give in the second year hard foods to babies that get intestinal indigestion.

DR. JAY I. DURAND, Seattle: There are many questions in metabolism which are yet to be answered. I have seen many babies in Finkelstein's clinic, which could not be made to gain by increasing the sugar even to 7 per cent. and 9 per cent., who would make a prompt and satisfactory gain when 1 per cent. of starch was added. The relation of fats to the different sugars presents another problem. A large series of cases were put on high fat feedings with 3 per cent. to 5 per cent. of dextrimaltose—*Nahrzucker*, as it is called there. They did very badly, almost all developing nourishment disturbances, which necessitated a change to albumin milk. Approximately an equal number with the same fat percentages and milk sugar did much better. We are now in a position to control, to a certain degree, the bacterial flora of the intestinal tract, and this is a great factor in carbohydrate digestion. The starches and sugars in excess bring a preponderance of the fermentation-producing, acid bacteria, tending to cause diarrhea. The proteins bring the putrefying, alkaline type which counteract the former. The great value of albumin milk is that you can feed much larger carbohydrate percentages and more fat with it than you can with any other nourishment yet devised. In older children there is a type of starch diarrhea often seen which will be corrected by adding beef, cottage cheese and mashed banana to the diet.

DR. H. H. YERINGTON, San Francisco: The discussion of this paper seemed to be on starch digestion in infants; the paper was on starch digestion after the first year, and I am sorry more was not said on this subject. As far as skin conditions are concerned, I do not know what proportion of children having starch indigestion have skin lesions, but many of these patients having urticaria and eczema clear up rapidly when the starch is eliminated from their diets. Dr. Porter has pointed out the correlation between these children and the feeding of certain diets. A mixed diet consisting of such articles as cottage cheese, gelatin jellies, meat, eggs and broths will be found very effective.

Early Fumigation

"Bring sulphur straight, and fire," the Monarch cries.
She hears, and at his word obedient flies.
With fire and sulphur, cure of noxious fumes,
He purged the walls and blood polluted rooms.
—*The Odyssey.*

SYPHILIS OF THE STOMACH

A CLINICAL STUDY OF TWENTY-SIX INSTANCES OF DYSPEPSIA, ASSOCIATED WITH POSITIVE WASSERMANN-NOGUCHI REACTIONS *

FRANK SMITHIES, M.D.
Gastro-Enterologist to Augustana Hospital
CHICAGO

This report comprises observations made on twenty-six dyspeptic individuals whose blood serums were Wassermann-Noguchi positive. In these patients the clinical history of lues was definite or highly probable, or at exploratory laparotomy atypical gastric pathology was demonstrated. Dyspepsia was the presenting complaint. The material is from records in my services at the Mayo clinic and at Augustana Hospital.

That syphilis of the stomach is by no means so uncommon as clinicians of a decade ago considered, is evidenced by the fact that within the past six years no less than twenty-five cases have been placed on record in the United States alone. Previously there had been but about seventy authentic instances of the affection reported. This recently indicated prevalence of the ailment is largely a result of the general use of serologic tests as a guide in the differential diagnosis of unusual intra-abdominal complaints.

INCIDENCE

Our twenty-six cases occurred in the examination of 7,545 patients affected with all types of dyspepsia. This returns an approximate frequency of one instance out of every 300 gastric cases (0.34 per cent.). Of this number there were 1,603 instances in which the gastric upset was associated apparently with demonstrable pathology in the stomach or duodenum. Of these 1.6 per cent. were luetic. The relative incidence of the syphilitic affection is emphasized by noting that in this group of cases, gastric cancer was found in 15.3 per cent., gastric ulcer in 18.7 per cent., duodenal ulcer in 39 per cent., achylias or gastritis in 24.8 per cent.

PATHOLOGY

The lesion may be congenital or acquired. It may be part of a general systemic syphilis or arise as a distinct, local manifestation of the disease. The infrequency of the affection as a part of general syphilis is indicated by the oft quoted observations of Chiari.[1] From necropsies in 243 pathologically demonstrated cases of lues, of which 145 cases were hereditary and 98 cases acquired, he noted that, while *indirect* changes in the stomach wall (circulatory anomalies, interstitial hemorrhages) are relatively common, *lesions directly attributable* to lues (ulceration, gummas and scarring) are infrequent.

Careful descriptions of luetic lesions in the stomach have been made by Flexner,[2] Neumann,[3] Chiari[4] and Weichselbaum,[4] while clinical classifications depending thereon have been advanced by Hemmeter,[5] Einhorn,[6] Kohn,[7] Morgan[8] and Downes and LeWald.[9] It would

* Read before the Section on Practice of Medicine at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Chiari: Internat. Beitr. z. wiss. Med., Festschr. f. R. Virchow, Berlin, 1891, ii, 211.
2. Flexner, S.: Am. Jour. Med. Sc., October, 1898.
3. Neumann: Specielle Pathol. u. Therapie (Nothnagel), xxiii, 351.
4. Weichselbaum: Bericht. d. Rudolfspitals in Wien, 1883, p. 383.
5. Hemmeter: Diseases of the Stomach, Philadelphia, P. Blakiston's Sons & Co., 1903, p. 596.
6. Einhorn: Med. Rec., New York, March 13, 1915.
7. Kohn: Am. Jour. Med. Sc., May, 1909.
8. Morgan: Am. Jour. Med. Sc., March, 1915, p. 392.
9. Downes, William A., and Le Wald, Leon T.: Syphilis of the Stomach, THE JOURNAL A. M. A., May 29, 1915, p. 1824.

seem from the nature of the ailment pathologically, that a close histoclinical grouping were possible.

Apparently the syphilitic virus first manifests itself as a dense round-cell infiltration of the loose, areolar tissue of the stomach wall. There is frequently an associated endarteritis. When the disease has once become firmly established, it appears to progress in four rather characteristic fashions: (1) by diffuse infiltrations, confined to the areolar tissue and causing thickening and stiffening of the gastric wall; (2) locally, to the submucosa and mucosa in the form of dense groupings of lymphocytes which may end as typical, miliary gummas, or coalesce, necrose and slough to form ragged-edged ulcers, not infrequently multiple; (3) in the form of single or multiple inflammatory nodules, composed of exuberant connective tissue and lymphocytes; these may involve the entire stomach wall, producing extensive tumors (ulcerating or non-ulcerating), stenoses and malformations in contour, and (4) subperitoneally and peritoneally, resulting in perigastritis associated with thickening of the wall of the viscus and dense perigastric adhesions.

As a consequence of these pathologic types the clinical manifestations of the malady are varied. Grossly, they may be summarized as those associated with chronic gastritis, ulceration (with or without stenosis), gastric tumor (with or without obstruction) and perigastritis, often with involvement of adjacent viscera.

ETIOLOGY

Sex: In the series forming the basis of this study, there were of the 26 cases, 15 men and 11 women.

Age: The minimum age was 20 years; the maximum 66. The minimum age for men was 20; for women 28. The maximum age for men was 60; for women 66. The accompanying table indicates the age incidence by decades for the sexes:

TABLE SHOWING AGE AND SEX INCIDENCE OF GASTRIC SYPHILIS

Years	Number of Men	Number of Women
0 to 10	0	0
10 to 20	0	0
20 to 30	2	3
30 to 40	2	2
40 to 50	5	2
50 to 60	5	3
60 to 70	1	1
Over 80	0	0
Total	15	11

It was noted that the average for women was 42.8 years and that for men 44.8 years, a sex difference of 2.4 years. Sixteen patients were married, five were single, three divorced and two widowed.

THE LUETIC LESION

It was sometimes difficult to get a history of the primary sore. This proved particularly so in women. Of the men, genital chancres were recorded in 7, buboes in 3, mouth or lip lesions in 1. In the women genital chancre was reported once. In two cases there had been mouth sores; in one, buboes. Definite knowledge of venereal disease in the husband was obtained in three instances; in two, the husband's condition was questionable. Of the entire group, there were five cases in which no history positive for, or suggestive of, lues could be obtained, nor in these patients could external evidences of previous lesions be seen. The Wassermann-Noguchi tests were, however, definitely positive.

Time of Gastric Disturbance After Acquirement of Lues.—Information in this line is but relatively correct, especially for the women. The average shows that there was but slight variation in the sexes. Four years was the minimum quiescent period for both sexes, while the maximum, was, for men, 38 years and, for women, 45 years.

Stage of the Disease.—So far as we were able to judge, we had no instance of a congenital affection. In two patients of each sex, the ailment appeared late in the secondary stage of lues. In the remaining cases (22) the gastric disorder was, chronologically, a tertiary manifestation.

Previous Specific Therapy.—Of the sixteen cases who gave definite or suspicious history of chancres or buboes, but eight had had antiluetic treatment. Of these only two had received a thorough course of mercury and iodid. Three had been given salvarsan for "anemia" within four years of their coming under observation.

WASSERMANN-NOGUCHI REACTIONS

These were positive in all our tabulated cases and furnish the basis of our classification. Inasmuch as the nature of the ailment demands diagnosis other than surgical or from sections of tissue removed at laparotomy or necropsy, we fail to see how another basis for classification could be adopted. Certainly, dependence solely on the "therapeutic test" of the effect of antiluetic medicines is not sufficient proof of the disease, for it has been shown that occasionally sarcomas, tuberculous lesions or other inflammatory affections are favorably influenced by salvarsan, mercury or iodids. If carefully controlled, only rarely is the positive serologic test associated with disease other than syphilis. In grave anemias, malignant cachexia or alcoholism, dubious Wassermann reactions are occasionally obtained. However, such factors were taken into consideration in our group of cases.

THE GASTRIC MALFUNCTION

Duration of All Gastric Disturbance.—Facts of considerable significance are brought out by analyses of this phase. It has been stated, frequently, that gastric syphilis manifests itself rather abruptly in late life without any previous digestive upset having been noted. Our study indicates that the average duration of dyspepsia was 8.4 years for the group: The minimum duration was six months—a male aged 60; the maximum 25 years—a female aged 52 years. There was practically no difference in the average duration between the sexes.

Duration of the Presenting Gastric Complaint.—The average time for the group was 11.1 months. The minimum was four weeks and the maximum 3 years. In women dyspepsia caused the patient to seek relief rather earlier than in men.

Types of Gastric Histories.—The cases group themselves quite readily, with regard to the clinical course of the dyspepsia, into three divisions: (1) instances in which a persistent gastric derangement appeared in individuals who had previously experienced no digestive upset; (2) instances in which a constant dyspepsia followed years of antecedent indigestion of the intermittent type; (3) instances in which continuous gastric upset arose in persons who had been affected gastrically at some past period, but who had been, for years, free from digestive disturbances. Each type will be summarized briefly.

Group 1: Two of the twenty-six instances of gastric syphilis studied comprise this group. Both were men who gave histories of genital, primary lesions. In one, the dyspepsia appeared shortly after secondary skin lesions had subsided, in the other it was the only evidence of a tertiary lesion. The affection was characterized by rather abrupt onset of epigastric pain and soreness, constant in character, but varying in intensity; by anorexia, moderate weight-loss, constipation, pyrosis, eructations, epigastric tenderness, and, in one instance, a freely movable epigastric nodule, associated with delayed vomiting. Gastric analyses revealed a fairly low formol index, absent Wolff test and moderate hypersecretion. In the case associated with epigastric nodule, fluoroscopic examination disclosed a filling-defect of the pylorus and antrum. In the other patient, roentgenoscopy pointed to a probable pyloric ulcer of the chronic, uncomplicated variety.

Group 2: This division was made up of ten cases (38.4 per cent.). The histories exhibit two rather strikingly different types of disease: (1) an early dyspepsia, characterized by frequent attacks of discomfort which has the clinical aspect of recurring peptic ulcer and (2) a subsequent period of continuous indigestion, which frequently assumes an aspect different from that exhibited by the first portion of the ailment.

The average duration of all symptoms in the first phase of the disease was 8.7 years. It varied between two years and twenty-three years. The histories indicate a gastric derangement associated with attacks of epigastric distress ("burning," "gnawing," "sore," "ache" or "colics") not uncommonly more pronounced at night or when the stomach was empty, irregular vomiting (hematemesis in one instance), water-brash, good appetite and body nourishment and abdominal tenderness. In the intervals, even without treatment, the patients were generally comfortable. So closely do symptoms and signs simulate those of ordinary, recurrent gastric ulcer, that the clinical differentiation, without the knowledge of specific infection or positive serologic test, is quite impossible. Three patients in this group had taken so-called ulcer "cures" repeatedly and four of them had submitted to surgical exploration: in two, ulcer of the stomach had been noted and posterior gastro-enterostomy performed.

The average duration of all symptoms in the second portion of this group was 1.12 years. The shortest period of discomfort was three months; the longest nearly three years. This phase of the ailment was different from that preceding it, in the sense that the patients were constantly annoyed by epigastric distress, frequently aggravated at night and not rarely of sufficient severity to require opiates (40 per cent.). During this stage, weight loss was not uncommonly rapid and of marked degree. The average weight loss in three months preceding the time that the patients appeared for examination was 17.3 pounds. There was one case in which weight loss was mentioned as "slight." The least weight loss was 6 pounds, the greatest 39.

Epigastric pain and tenderness were generally most marked in the right upper quadrant. In four instances (40 per cent.) there was a palpable epigastric mass. Pain was most commonly relieved by limiting the amount of ingested food, by lavage and the taking of alkalies. In two instances persistent vomiting developed, with coincident evidences of marked gastric stagnation. Test meals revealed an average total acidity of 39.7, average free hydrochloric acid 30 and average combined acid of 9.8. In only one instance was hydrochloric acid absent. The highest free hydrochloric acid noted was 110. Twelve-hour retention was demonstrated in but two cases. In six instances in which the formol index was estimated, it averaged 11. In three instances the Wolff test for soluble albumin was positive, but was negative in five. Lactic acid was observed but once. In the case in which hydrochloric acid was absent, organisms simulating those of the Oppler-Boas group were recorded.

Roentgenoscopy returned the diagnosis of chronic peptic ulcer or suspicious ulcer or "tumor" of the stomach in eight instances. In only one case had the question of syphilis been considered. In five patients exploratory laparotomy was performed. In three instances, smooth, pale calloused ulcers were noted (in one case three ulcers were noted on the anterior wall and one on the lesser curvature). The stomach of another patient exhibited a profuse infiltrating scirrhus growth, with a small nodule on the lesser curvature. In the remaining case, a smooth, hard tumor the size of a lemon occupied the pyloric portion of the stomach.

From the above summary of cases making up Group 2, it is seen that the clinical course strongly simulates that of chronic peptic ulcer which later undergoes malignant degeneration—with this exception, however, that while anemia, weight loss, pyloric obstruction, cachexia and epigastric nodule or ridge may be present, the gastric analysis reveals moderately high total and free hydrochloric acid with no increase above the normal formol index, and with only irregular manifestations of a positive Wolff test. Even at laparotomy the diagnosis is often in doubt, but surgeons of experience have learned to leave undisturbed the well-delimited, hard, plaque-like ulcers and the firm nodular tumors which arise from a stomach wall, already thickened by diffuse, infiltrating, exuberant connective tissue. It is in this class of case that information of vital value is received from the serologic test. The reaction frequently determines the advisability of surgical interference.

Group 3: Fourteen cases composed this division. The early portion of the histories in these instances is not characteristic of any definite type of intragastric disease, associated with any special, gross, anatomic lesion. Previous to the terminal complaint, the early gastric upset has made itself manifest in spells often at long or irregular intervals. Not uncommonly, the different attacks exhibit no similarity as to type. In this group, the average duration of the early gastric dyspepsia was 9.1 years. The shortest period was one year; the longest twenty-five. In this first stage the indigestion was variously associated with epigastric discomfort (often styled "vague ache" with tightness and burning), and frequently complicated by irregular, colicky attacks. The pain was usually situated in the pit of the stomach, or right epigastrium, but not rarely had no definite point of localization. Pain relief was commonly obtained by diet, alkalies, vomiting, the ingestion of food or the administration of an opiate. In but three instances did the epigastric distress bear any definite relation to food intake. This type of gastric malfunction eventually terminated in a stage in which the dyspepsia was constant. There then ensued loss of appetite, constipation or constipation alternating with diarrhea, and weight decline averaging, for the group, 20.7 pounds. In three instances there were epigastric ridges or masses, in two cases such were complicated by pyloric obstruction. The test meal revealed an average total acidity of 51.9, an

average free hydrochloric acid of 30.9 and average combined acidity of 18. There was only one instance in which hydrochloric acid was absent. In eight instances, in which the formol index was estimated, it averaged 10.2. In the same group the Wolff test was positive three times. Roentgen record of an intragastric condition simulating chronic ulcer or tumor was obtained in nine cases. In the remaining instances, the examination was not made or its result was questionable. Surgical exploration was performed seven times. Laparotomy disclosed chronic ulcer or single and multiple fibrous nodules. In one case the stomach appeared negative, but the gallbladder was filled with stones.

The above description of cases making up Group 3 demonstrates that although the early part of the history may differ markedly from that composing the first portion of that outlined by Group 2, the terminal stage and the laparotomy findings are strikingly similar to it.

LABORATORY DATA FOR THE ENTIRE SERIES

Blood: In seventeen cases in which hemoglobin was estimated, it averaged 74 per cent. The variations were from 20 to 90 per cent.

Stool: Of twelve cases tested for occult blood by the benzidin technic, positive reactions were obtained in two.

Test Meals: Persistent, twelve-hour retention was demonstrated in six instances (23 per cent.).

Gastric Acidity: In but two cases was absent hydrochloric acid proved. The average free hydrochloric acid for the group was 33 and the maximum 110. The average total acidity was 51.4. The maximum was 114. This was a short term case included in Group 3 in which pyloric stenosis with a palpable epigastric nodule was observed. Combined hydrochloric acid and acid salts averaged 14.2. The minimum was 0 and the maximum was 36. The presence of lactic acid was determined in the gastric contents from three cases (11 per cent.).

Altered blood was proved to be present in seven gastric extracts (26 per cent.).

The Wolff-Junghans' test was positive in five cases in the entire group. The formol index, as estimated by the formaldehyd titration method suggested by Sorenson and Schiff, averaged for the group 10.2. The minimum was 6 and the maximum 14. It would seem that this test when interpreted in the light of clinical history and other laboratory data promises to furnish an important point of differentiation between syphilitic and malignant lesions, inasmuch as we have shown that in a series of eighty-seven gastric cancers and ulcera carcinomatosa the average formol index is 21.

Microscopic Examination of Unfiltered Gastric Extract: In these, using the colored agar staining method, budding yeasts were demonstrated in eleven cases (43.3 per cent.); sarcines in four cases (15.3 per cent.) and organisms apparently of the Oppler-Boas type once (3.8 per cent.).

INFORMATION DERIVED FROM ROENTGENOSCOPY

Usually neither fluoroscope nor plate methods return pathognomonic signs. The Roentgen method may ocularly demonstrate deformities in gastric contour, but in the main such deviations from the normal might readily be observed in benign or malignant peptic ulcer and carcinoma, scirrhus or medullary. It has seemed to us that a Roentgen sign of some worth were to be deduced from the rather anomalous finding of a gastric tumor or extensive deformity, associated with a fairly high degree of peristalsis and with test meal returns showing normal, or slightly reduced free hydrochloric acid. When a positive Wassermann-Noguchi test is concomitant the diagnosis is established with reasonable certainty. Not rarely, the Roentgen demonstration of extremely small gastric nodules, multiple ulcerations or tumor formation proves suggestive enough to lead to the making of serologic tests and the beginning of specific therapy.

TREATMENT

The most satisfactory results are obtained by the intravenous injection of salvarsan, followed by a thorough course of mercury (by fumigation, inunction or hypodermically) and iodids. Not infrequently, the anemia coincident wtih the disease demands the free use of iron and arsenic. The associated dyspepsia may urgently call for relief by such measures as diet, alkalies, lavage, or, for the pain, opiates.

It would seem that one should be cautious about speaking definitely regarding the cure of gastric syphilis. Inasmuch as we have shown that the disease may exist for years and manifest itself frequently by periodic digestive upsets, it behooves us to be rather careful in informing patients respecting what may be expected from therapeutic procedures. Should the case be one of the type associated with infrequent attacks, it is quite possible that such attacks would have become quiescent even without the administration of medicines. In treating the continuous stages of the ailment, one rarely obtains complete cessation of all symptoms and signs. In our series when reliable data were available, but four patients were wholly freed from dyspepsia for so long as a year. Three patients were not benefited at all, while twelve patients appeared to experience amelioration of their gastric disturbances.

29 South La Salle Street.

ABSTRACT OF DISCUSSION

DR. DUDLEY FULTON, LOS ANGELES: I have seen but one case in my practice that I thought to be syphilis of the stomach, a patient aged 36, who presented the typical syndrome of septic ulcer and who failed to improve under the ordinary medical treatment. The history of syphilis and a 4-plus Wassermann test led to mixed treatment with clearing of the symptoms, the patient making uninterrupted recovery. The diagnosis of syphilis of the stomach is difficult to establish. In many cases a conjecture is resorted to where satisfactory proof of the diagnosis is lacking. But it is significant that of late a good many clinicians and surgeons have reported cases of gastric syphilis which were not recognized until after operation. More recently, where demonstrable lesions of the stomach were demonstrated in syphilitics, the benefit of the doubt was given and medical treatment for syphilis administered, with cure resulting in some of the cases. In the future, syphilis of the stomach will probably be recognized more often than in the past. Gastric syphilis is undoubtedly a clinical entity which represents simply a refinement in diagnosis. The reasons why syphilis of the stomach has been overlooked so frequently in the past are various. In the first place the symptoms are not typical; secondly, both the macroscopic and the microscopic lesions are often difficult to recognize definitely, but at the present time the Wassermann test and roentgenology bridge over these difficulties in diagnosis. When a patient with a history of syphilis, who has well defined gastric symptoms and in whom the roentgenogram demonstrates gross changes in the stomach, a tentative diagnosis of syphilis of the stomach is justifiable and specific treatment may be instituted; but it should be remembered that the disappearance of symptoms is not definite proof of the syphilitic nature of the gastric lesion any more than does the relief of gastric symptoms in

cardiorenal disease establish proof of a primary gastric trouble. On the other hand, the lesion may be too old or the treatment instituted too late for treatment to be of avail. Aside from these more or less theoretical considerations of the subject, it would seem that the rules suggested by Chase are sufficiently exacting and practical in clinical work. These are that there must be more than the statement of the patient that he has had syphilis. The Wassermann test must be positive. Second, there must be evidences of syphilis elsewhere in the body. Third, there should be demonstrable lesions of the stomach, as shown by the Roentgen ray. Lastly, there should be therapeutic improvement.

Dr. S. Marx White, Minneapolis: We can scarcely overestimate the importance of Dr. Smithies' contribution. His evidence and that of others who are studying the incidence of syphilis of the stomach would seem to show that it is not a frequent malady in the form which he has described. It is a subject to which particular attention needs to be drawn because it is so commonly overlooked. It is impossible to say whether the pathologists of the dead-house are giving us the correct impression or not. They are inclined to look somewhat askance at the diagnosis of syphilis of the stomach because of their failure to find lesions after death, such lesions being very infrequent at necropsy. But we should not let that influence us unduly because the same thing was true in lesser degree in ulcer of the stomach, which was found at first most frequently by the surgeon. Dr. Smithies calls attention to the importance of the Wassermann and the Noguchi tests in the recognition of this condition. I believe no case of organic disease of the stomach which gives evidence of change in form in the radiographic outline of the stomach, should be passed without the consideration of syphilis as a possible cause. In cases with the evidence of ulcer or ulceration with perigastritis, we should beware of the possibility and make tests for syphilis. We should be inclined to consider the possibility of syphilis in all cases of disease of the stomach and heart where the symptoms are not clear, and make proper serologic tests. I have seen four cases in which the evidence pointed to syphilis of the stomach, and in two very definite improvement occurred on the institution of proper antisyphilitic treatment.

One case simulated clinically carcinoma with palpable tumor. That case disappeared from observation and about four years later the patient died under the care of another physician with the diagnosis of carcinoma of the stomach. The patient had concealed his syphilis, but necropsy showed that it was not a case of carcinoma of the stomach, but was syphilis. Another subject to which we should pay attention is the occurrence of gastric disturbances, particularly during the so-called secondary stage of syphilis. These are much more common than we are inclined to believe. I have seen a number of instances of the milder type in the eruptive stage of syphilis.

Dr. Max Einhorn, New York: According to my experience, syphilis of the stomach is more frequent than is generally believed. However, the variety which goes on to tumor formation is not very common. In this variety we may find all the symptoms, without exception, of cancer of the stomach. We found in the majority of cases which we have observed that there was a deficiency or absence of hydrochloric acid, that lactic acid and blood were present, especially occult blood in the stomach. For the practitioner these cases are of the greatest importance, because for syphilis we have a treatment which will cure the patient, whereas we cannot cure the patient with cancer. The Wassermann reaction is of assistance in some cases, but we have seen cases with a negative Wassermann reaction. There was then a large tumor, with the Wassermann reaction negative, and on operation we found the tumor so large it could not be removed and the abdomen was closed up. In the varieties in which there is only an inflammatory process, it may disappear without any treatment at all, without iodids or mercury, and so we might think it is not luetic. But in the case we had under observation the tumor could be palpated and it was believed to be an inoperable cancer. Iodids and mercury were given notwithstanding the Wassermann was negative, and to our surprise the patient got well. The Wassermann test in that case had been made by a thoroughly competent physician. There may be the question of sarcoma or cancer in such cases, but that should not deter us from a consideration of the possibility of syphilis of the stomach although the Wassermann reaction may be negative at the time. Because the Wassermann test is found negative, we should not conclude that nothing can be done. Empiric treatment is justifiable and can do no harm to the patient.

Dr. George Eusterman, Rochester, Minn.: We have had under observation twenty-one cases of syphilis of the stomach. In an earlier period ten were explored by the surgeons, and later improved under treatment. In eleven others there was a history of infection with or without a positive Wassermann, gastric disturbances and gross changes in the stomach determined by Roentgen methods. I wish to emphasize the importance of excluding other causes in suspected syphilis, and also to warn every one to not make too hasty a diagnosis of syphilis. There may be positive Wassermann reactions with gastric upset not due to syphilis, or the Wassermann test may not be obtained in a case of syphilis of the stomach; the Wassermann reaction may be absent following the use of salvarsan. The symptomatology is variable because the pathology is variable. These patients all showed extensive deformity of the stomach, or multiple strictures, hour-glass stomachs, etc. I am not including here the cases of syphilitic gastritis but am speaking only of the organic lesions due to syphilis. One of the most characteristic features is the absence of definite symptomatology. All of these patients had achylia or marked reduction in enzymotic activity. There was an apparent paucity of history of hemorrhage.

Dr. Charles E. Sears, Portland, Ore.: I have had occasion recently to review the literature of syphilis of the stomach, and in connection with this I was very much interested in Dr. Smithies' remark regarding the therapeutic test as a diagnostic procedure. The undoubted cases of syphilis of the stomach which have been reported, in which the lesions are more than transitory, are very few. For this reason I think Dr. Smithies' paper is all the more important. In order to establish a symptomatology on which to base the recognition of these cases, we should exclude, for scientific report, the cases in which the diagnosis was decided by the therapeutic test. For practical purposes we must make the diagnosis at times by the therapeutic test. The question of the secretory function of the stomach in these cases is interesting. I have had a case under observation recently in which the manifestations were those of carcinoma of the stomach. It was only six months in duration, of gradual onset, achylia, and without definite pain, in a young woman who had concealed her previous syphilitic history until an operation had been performed. A diagnosis of probable carcinoma, possibly developing on an ulcer, was made and at operation a plaque-like ulcer was found involving the lesser curvature close to the pylorus and a pylorectomy was done because of the many indurated lymph glands found on the peritoneal surface near the ulcer, which were very suspicious of carcinoma. The ulcer was subjected to microscopic examination and a very pronounced lymphocytic infiltration was the most characteristic thing found. There was no evidence of carcinoma. In the reported cases in which gastric ulcer has been undoubtedly demonstrated to be syphilitic, achylia was found in practically all the cases and nearly as often there was found absence of definite pain. In the cases recognized by therapeutic test the frequency of night pain is very striking. The absence of pain and the presence of achylia I believe are important; whether they are characteristic of syphilitic ulcers time will show.

Dr. Frank Smithies, Chicago: Dr. Eusterman has stated that in his experience the test meals from cases of gastric

syphilis revealed absent hydrochloric acid. A few years ago it was supposed that in order to diagnose carcinoma of the stomach it was necessary to have absent free hydrochloric acid in the gastric extract. We now know that when the diagnosis of carcinoma rests on this finding we are dealing with the hopeless, terminal condition. An analogy probably exists in syphilis of the stomach (where the diagnosis is based on the Wassermann test) at the stage when we can handle it medically, and at that when there is such deformity of the stomach as to simulate that of gastric cancer. I think we should make an effort to diagnose syphilis of the stomach before the patient is dying from syphilis of the stomach, just as it behooves us to recognize cancer of the stomach before the patient is ready for the undertaker. This paper has served its chief purpose if it has called attention to the fact that syphilis of the stomach may be recognized during life and sufficiently early to permit of proper therapy. Cases exist in which there may be no hydrochloric acid in gastric extracts just as in carcinoma, but when the disease is early recognized there may be normal hydrochloric acid.

It will be recalled that I based my classification essentially on the findings of the Wassermann and Noguchi tests. Dr. Einhorn has shown that the therapeutic test is not conclusive for diagnoses, although it may be valuable clinically. Syphilitic ulcers simulate the carcinomatous in many ways. The Roentgen ray may show gross deformity of the stomach and even tumor formation. There may be hypoperistalsis or delayed emptying. There may be a relative low hydrochloric acid titration, but many of our cases did not show it. The information derived from the Wolff-Junghans' test and the estimation of the formol index offers valuable assistance in differentiating syphilitic and malignant gastric ailments.

DR. JOSEPH VON WERTHERN, San Francisco: In cases of gastric ulcer occurring in young women, could we fairly assume the hypothesis that those particular cases might be due to inherited syphilis?

DR. FRANK SMITHIES, Chicago: In cases of gastric ulcer occurring in young women such is a possibility without the history or clinical evidence of syphilitic infection if Wassermann-Noguchi tests are positive.

SPECIFIC TREATMENT OF THE MALIGNANT FORMS OF MALARIA*

C. C. BASS, M.D.
Professor of Experimental and Tropical Medicine, Tulane University of Louisiana School of Medicine
NEW ORLEANS

By malignant forms of malaria I mean those cases of malaria that prove fatal, those that would prove fatal without proper treatment and those that are sufficiently severe to immediately endanger the life of the patient. The specific treatment of this or any other form of malaria is treatment with quinin. There is no other specific remedy for malaria.

Practically all cases of malignant malaria are due to the estivo-autumnal plasmodium (*P. falciparum*). This parasite spends about three-fourths of its life cycle lodged in capillaries and only about one-fourth in the circulating blood. The very fact that it remains during so large a portion of its life in capillaries enables it to produce the severe forms of malaria. It seems quite possible that prevention of the proper flow of blood through the capillaries of vital organs by large numbers of plasmodia lodged in them may be the chief source of symptoms which would lead to the case being classified as one of malignant malaria. For instance, almost all patients have coma for a greater or lesser period before death. Coma is perhaps the most certain symptom indicating a malignant form of the disease. Coma in malaria is due to the anemia of the brain resulting from the large number of capillaries plugged by malaria plasmodia.

Quinin in the blood does not reach plasmodia lodged in capillaries. If in sufficient concentration, however, it does kill those in the circulating blood. Plasmodia lodged in capillaries come out into the circulating blood after they segment and are thus exposed to the action of any quinin that is in the blood at the time. Since, in estivo-autumnal malaria there is continuous segmentation—each parasite segmenting independently of others—and continuous appearance of young plasmodia in the blood stream it is necessary to keep a sufficient concentration of quinin in the blood to kill them at all times. Whenever a dose of quinin is introduced directly into the blood it appears in the urine in a few minutes. Many individuals eliminate more than 50 per cent. of it within twelve hours and practically all within twenty-four hours. Thus it is seen that in order to have sufficient quinin in the blood at all times to destroy malaria plasmodia as they appear, which they will do for a period of at least thirty-six hours, it is necessary to administer it every few hours during this period.

There are three methods of administration for consideration—by mouth, hypodermically or intramuscularly, and intravenously. Administration by mouth in malignant malaria is frequently impossible on account of the condition of the patient, or if it can be administered it is frequently vomited. Not only may it be difficult to administer in this way, or be vomited, but if retained, absorption in these cases is slow and uncertain. It is likely to be several hours before the quinin reaches the blood stream where its effect is desired. Many a patient dies with enough quinin in his stomach to have saved his life if it had been given properly.

The next method of administration is introduction into the tissues by means of a hypodermic syringe. We are accustomed to think of the hypodermic as a rapid means of getting drugs into the blood stream. This is so with many drugs, but it is not so with drugs like quinin which cause severe local damage to, and frequently necrosis of tissue. The least irritating form of quinin—the bimuriate with urea—will produce necrosis of tissue if introduced in sufficient concentration. If more dilute, inflammation only is produced. It is less likely to produce necrosis when injected into the muscle than when injected into loose areolar tissue. The rate of absorption varies with the dilution employed and the tissue into which it is injected, as well, perhaps, as with different individuals. Sometimes some of it reaches the blood stream in a few minutes, but at best it is many hours before all of the dose injected is in the blood. In case of severe local inflammation it may be many hours or days before the quinin is absorbed, or in case of necrosis it may never be absorbed. Many a patient has died of malaria with more than sufficient quinin in his tissues to have saved his life had it been properly administered.

Whenever quinin is administered intravenously it reaches the circulating blood at once where it is needed, and whatever good can be accomplished by specific

* Read before the Section on Practice of Medicine at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

treatment begins to be realized. Whenever, as in malignant cases of malaria, the life of the patient depends on getting quinin into the blood stream quickly, there is no other method to consider.

The dose and method of administering quinin intravenously are important. I do not believe it is ever necessary to exceed 30 grains of quinin hydrochlorid during twenty-four hours when administered intravenously, nor do I believe more than 10 grains should ever be given at one time. Large doses of quinin given intravenously are very dangerous. Twenty grains often produce considerable shock, dizziness, nausea, etc., and a dose of 50 grains has killed in several instances. A serious mistake often made in the treatment of the most urgent cases of malaria is the introduction of large and dangerous doses of quinin which are repeated at frequent intervals until the patient dies. I have known of several instances in which one hundred grains or more of quinin had been administered during the last twenty-four or thirty-six hours before death. Usually, this destructive treatment is continued because the patient continues to get worse. The symptoms attributed to a continuation of the reproduction of malaria plasmodia are usually due to the quinin. Examination of the blood of such patients usually shows few malaria plasmodia and most of them are dead or dying. The necropsy fails to reveal sufficient plasmodia to cause death. In other words the cause of death is quinin poisoning and not malaria. In view of these statements and ideas, if correct, the amount of quinin given should not approximate the lethal dose. Danger can be further avoided by administering it in several small doses not exceeding 10 grains at any time. Ten grains of quinin hydrochlorid given intravenously every eight hours or 5 grains every four hours will kill plasmodia in the blood stream and prevent their reproduction as certainly as any larger quantity and will not endanger the life of the patient. It is true that it does not reach plasmodia lodged in capillaries until they segment and their merozoites appear in the blood stream.

Theoretically, inhalation of amyl nitrite should tend to dislodge plasmodia from the capillaries, and if done after quinin has been introduced into the blood, would expose many of them to the action of the quinin that would not otherwise be exposed.

In most malignant cases of malaria the total quantity or mass of malaria plasmodia produced during a single life cycle of the parasite is enormous. The volume of an estivo-autumnal schizont at maturity is about that of a red blood cell. Using this as a basis we may calculate approximately the total volume that would be produced in the body of a patient during the life cycle of a plasmodium. It is common to find in such cases at least one red blood cell in every five to contain one or more plasmodia. If we assume that a man has 6,000 c.c. of blood, one-half of which, or 3,000 c.c. are red blood cells, there would be produced 600 c.c., or more than a pint of malaria plasmodia. It is strange, but nevertheless true, that patients often recover when given proper treatment in spite of this enormous amount of foreign protein in their blood stream. May it not be due to the fact that the protoplasm of the parasite is of very low toxicity?

As soon as a case of malignant malaria passes out of the severe attack, then of course the treatment is not different from that of other cases of malaria and will not be discussed here.

Malarial hemoglobinuria may be discussed briefly under the title of this paper. In malarial hemoglobinuria something occurs which causes hemolysis of the patient's cells. Cells containing plasmodia, and thus damaged, are affected more certainly and more extensively than the normal cells. As a result they are hemolyzed, leaving the plasmodia they contained exposed to the plasma, which promptly destroys them. The only object of giving quinin in malaria is to destroy plasmodia, and if most or all of the plasmodia have disappeared, which is the case in hemoglobinuria, there is no indication for quinin. There is a certain amount of contraindication, however, because quinin tends to increase hemoglobinuria or to precipitate attacks in otherwise susceptible individuals.

SUMMARY

The proper specific treatment of malignant or pernicious malaria is quinin administered intravenously.

The dose should never exceed 10 grains of the hydrochlorid.

The total quantity given should never exceed 30 grains during twenty-four hours.

Malarial hemoglobinuria does not require quinin. Quinin is harmful in most cases of hemoglobinuria.

ABSTRACT OF DISCUSSION

DR. WALTER BREM, LOS ANGELES: Dr. Bass has offered an interesting experimental explanation of the fact that has long puzzled those who have worked with malaria; that is, that the estivo-autumnal parasites disappear from the blood after the early stage of their development. Dr. Bass said he thought that the pernicious cerebral type of malaria is due to blocking of the capillaries of the brain. In my work in Panama I came to divide the pernicious cases into three groups. In the first group I put the cerebral cases, due to plugging of the capillaries of the brain. The second group includes those in which there is intense infection. Determined by the appearance of hemoglobin in the urine, detected not by the naked eye but by tests for blood in the urine, I found that a 6 per cent. infection of the blood corpuscles was the dividing line between pernicious malaria of the type of intense infection and the nonmalignant type of malaria. The capillaries of the brain in these cases often became blocked. I never saw recovery of a patient who became comatose with a 6 per cent. infection of the red blood corpuscles, whereas in the comatose group with less than 6 per cent. infection I have often seen recovery. The third group is the provisional group of the hemoglobinuric type, the so-called blackwataer fever, which I believe to be due to malaria, although that has not been absolutely proved.

I was interested in the fact that from experimental observations Dr. Bass had arrived at the same conclusions that I had reached from clinical observation and pathologic studies at necropsies, namely, that quinin does not reach the parasites lodged in the capillaries of the brain, so that when this occurs to any great extent, recovery is practically impossible.

As to the methods of administration of quinin, in Panama I gave quinin intramuscularly for a long time, but I finally arrived at the conclusion that the only call for the intramuscular injection of quinin, excluding the malignant cases, is when the patient is nauseated and vomits the quinin when given by mouth. Even in the cases in which there is vomiting during the paroxysms, during the intermissions quinin can be given by mouth and is quite effectual. I found the best method of administering quinin in routine to a larger number of patients, is to give it during the early morning hours, when they are not vomiting and can take it best. This I found was due to the fact that the paroxysms occur in the afternoon in over 80 per cent. of the cases. The quinin in this way is introduced before the sporulation of the large

number of parasites which cause the paroxysms, and it then seems to have the best effect. Thirty grains of quinin given in this way was better than 40 grains given in 5-grain doses every four hours, with two extra 5-grain doses before the paroxysm was due. I have seen several cases in which the patients died after the destruction of the parasites as far as we could tell, and they showed evidence of intense toxemia at necropsy.

DR. C. S. WILLIAMSON, Chicago: I should like to ask Dr. Bass as to the time necessary to keep up treatment after recovery from the immediate symptoms. In Chicago we see little malaria and all of it is apparently imported. However, I have seen cases in the past year which have given considerable trouble from recurrences. After giving quinin until the symptoms disappeared, and then in one case giving it for three months until the spleen was apparently no longer enlarged, to my intense disgust there was a recurrence after some three or four months, the patient having been in Chicago all the time. I would like to know how long Dr. Bass gives quinin and what is to be our criterion in stopping the drug. My own experience has been insufficient to settle this question.

DR. C. C. BASS, New Orleans: In endeavoring to answer the question of the last speaker, I feel we have a great deal to learn in the treatment of malaria. There is a great deal that is desirable to know that we do not yet know. We cannot lay down dogmatic rules by which all cases of malaria can be cured or can be disinfected of the malarial plasmodia. Most cases are disinfected by taking quinin for a period of four to six weeks. The cases that continue and relapse from time to time after that much treatment or even more are exceptional cases. Often it occurs that a patient gets rid of his malaria after three or four days' treatment with quinin. Often a little longer is sufficient to rid the patient of his malaria for all time. The apparent cases of relapse after thorough treatment are often cases of reinfection. The recent work on malaria carriers has brought to light most valuable information along this line. Given a family in which a case or two of malaria exist, if we examine the other members of the family we will find some of them also have plasmodia, although they are not sick and possibly never will have attacks of malaria. They are quite capable of infecting mosquitoes and the patient therefore lives in a house where there are infected mosquitoes capable of reinfecting him. That of course would not occur where there were no mosquitoes to be infected.

THE RELATION OF ANIMAL TO HUMAN SPOROTRICHOSIS

STUDIES ON AMERICAN SPOROTRICHOSIS III *

K. F. MEYER

SAN FRANCISCO

In several publications on "Sporotrichosis in Man," investigators have advanced the theory that the infection in some of the cases was undoubtedly from cases of animal sporotrichosis. The evidence supporting their views is mostly indirect, and since 1911 it has been my effort to investigate such cases and to reach, if possible, more definite conclusions. Most of the work which I report in this paper was carried out in Pennsylvania.

Spontaneous sporotrichosis in animals has been known to exist in the United States since 1909, when Page, Frothingham and Paige[1] described their findings of sporotricha in the pus of abscesses, which had been collected from so-called cases of "epizootic lymphangitis" in Butler County, Pennsylvania. The disease of "epizootic lymphangitis" was reported by Pearson[2] in 1907, his attention having been called—by veterinarians in the western part of the state—to such cases, which resembled farcy, but did not give the immunity reactions of that disease.

Following the publication of Pearson on this subject, Fischer[3] from Ohio; Crewe[4] from North Dakota, and Mohler[5] reported cases of epizootic lymphangitis in Ohio, North Dakota and Iowa.

In 1912, I was able to report[6] before the Pathological Society in Philadelphia, that epizootic lymphangitis does not exist in Pennsylvania, so far as my investigations permitted me to procure material, but that all of the cases were sporotrichotic infections. By examination of pus and serums of horses from North Dakota, which I received through the courtesy of some of my students, I established conclusively the existence of the malady in that state. By positive cultures from material received, the proof was forthcoming quite recently that sporotrichosis of horses existed also in Montana, close to the North Dakota border and the Missouri valley. According to a personal communication from Dr. J. R. Mohler, the pathologic laboratory of the Bureau of Animal Industry has isolated a sporothrix from the pus of a case of "mycotic" lymphangitis from South Dakota.

Illustrations in various livestock reports from Iowa and Ohio clearly prove the occurrence of sporotrichosis in those states. Personal information obtained from Kansas would make it appear that sporotrichosis is also seen in that state; bacteriologic evidence could not be procured, however, even though repeatedly asked for.

In the state of Pennsylvania, until 1913, the disease was declared a reportable disease, and therefore the most reliable information could be obtained from this state. According to the figures mentioned in the accompanying table, which will be discussed later, more than three hundred cases have been observed since 1907. The figures have been collected from the animal reports of the Pennsylvania Department of Agriculture. They are, for the years 1907-1911, fairly dependable, although most of the cases were diagnosed by mallein only and not by cultural tests. But inasmuch as farcy is the only disease which will be mistaken for sporotrichosis in Pennsylvania, a negative mallein or agglutination test will decide, with fair accuracy, if the later dermatomycosis is present or not.

With a few exceptions, most of the cases occurred in the northwestern part of the state, in Butler, Armstrong, Jefferson, Mercer and Clarion counties. Three cases were found to have originated in Philadelphia and adjacent counties. On the accompanying map is indicated the location of the cases of sporotrichosis

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* From the Department of Pathology and Bacteriology, University of California.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped, addressed envelope.

1. Page, Frothingham and Paige: Sporothrix and Epizootic Lymphangitis, Jour. Med. Research, 1910, xxiii, 137.

2. Pearson, L.: Epizootic Lymphangitis in Horses and Mules, Thirteenth Rep. Pennsylvania Dept. of Agric., 1908, p. 134, and Circular No. 8, Commonwealth of Pennsylvania, State Live Stock Sanitary Board, Harrisburg, 1907.

3. Fischer: Epizootic Lymphangitis, Seventh and Eighth Annual Reports of the State Board of Live Stock Commissioners of Ohio, 1907-1908, p. 13, and 1908-1909, p. 13.

4. Crewe: Second Annual Report of the Live Stock Sanitary Board of North Dakota, 1908.

5. Mohler, J. R.: Mycotic Lymphangitis, Twenty-Fifth Annual Report Bureau of Animal Industry, for the year 1908, Washington, 1910, p. 229.

6. Meyer, K. F.: Sporotrichosis of Man and Domestic Animals in Pennsylvania, Path. Soc., Philadelphia, Sept. 26, 1912.

observed in Pennsylvania in 1909-1912, and one realizes at once that the distribution of the cases follows the hilly water-sheds of the Allegheny and Ohio rivers closely.

Apparently, telluric conditions are an important factor, because most of the horses found infected worked on farm lands recently opened for cultivation. The rods are invariably spread with decayed logs and other remnants of the virgin forest. In some localities, infected horses were found grazing on pasture lands which were thickly studded with old tree stumps. Through the work of de Beurmann and Gougerot[7] it is known that on the bark of trees particularly and on vegetable matter in general, the sporotricha develop saprophytically. In the middle West and Northwest the distribution of sporotrichosis along the Mississippi and Missouri Rivers seems to support the observations in Pennsylvania. It is probable, however, that the organisms—particularly the spores—have been brought down by the river-water to the prairie land from the thickly vegetated forest lands; the gradual diminution in the number of cases from the source toward the zootic lymphangitis"; sporotrichosis infections occur during winter and summer and are not confined to the rainy season.

This is not the place to consider the extensive and detailed bacteriologic studies which were conducted with 35 strains from various sources. All the methods of identification permitted the conclusion that sporotricha isolated from animals are identical with those from man, and the name *"Sporotrichum Schenckii-Beurmanni"* has been proposed for all the American sporotricha.[9]

Detailed accounts of the experiments will be given in my future publications on "Sporotrichosis."

The pathogenicity of the equine sporotricha for small laboratory animals was established, but it was noted that it is lower than for the human strains isolated in the United States. The most susceptible animals, like young rats, in many cases developed local abscesses only, from which they spontaneously recovered.

Generalization was less frequently seen with equine than with human strains. When it occurred, the

SPOROTRICHOSIS IN MAN AND ANIMALS IN NORTH AMERICA*

State	1898 M.	1900 M.	1904 M.	1905 M.	1907 M.	1907 H.	1908 H.	1909 M.	1909 H.	1910 M.	1910 H.	1911 M.	1911 H.	1912 M.	1912 H.	1913 M.	1913 H.	1914 M.	1914 H.	Total Human Infections, Cases
California								1 (C)												1 (1C)
Dist. Columbia																		1 (1C)		1 (1C)
Illinois										2(1C)						1 (1C)				3 (2C)
Indiana		1												1 (C)						2 (1C)
Iowa		1 (C)												1 (1C)						2 (2C)
Kansas								1 (C)		2(1C)		9 (5C)		1 (C)†						13 (8C)
Minnesota														2 (2C)						2 (2C)
Missouri	1 (C)									2(1C)		1 (1C)						5 (5C)		9 (8C)
Montana														1 (C)						1 (1C)
Nebraska										5(1C)				2 (2C)		1 (C)				8 (4C)
New Jersey										1										1
New York												2 (2C)								2 (2C)
North Dakota			8 (1C)	2	1					1(C)		1 (C)		9 (4C)	1 (1C)		3			22 (7C)
Ohio						8 (?) §			2§ 1D			1 (C)								1 (1C)
Pennsylvania					(67)‡ (4C)	25D(2C)§ 16‡			56 22D 50(1D)‡		22(14D)		27(15D) 1 dog	1 (1C)	36 (7D) (6C)	2 (2C)	50 (10C)		2 (1C)	5 (3C)
South Dakota												1 (C)		2 (2C)	1 (1C)	1 (1C)				5 (4C)
Texas										1		1 (C)								1 (1C)
Virginia																1				1
West Virginia																		1 (1C)		1 (1C)
Wisconsin												1								1
Canada												2 (1C)								2 (1C)
	1 (1C)	2 (1C)	8 (1C)	2	1			2 (2C)		14(5C)		19(13C)		20(15)		6(5)		7 (7C)		82 (50C)

* In this table M = man; H = horse; D, killed; C, diagnosed by cultures. † Probably. ‡ Diagnosed by simple microscopic examination.
§ In all more than 100. ¶ Total number not certain.

mouth of the river, is quite indicative of the condition in North Dakota, Kansas, Missouri, etc. The climatic conditions play, perhaps, a certain rôle; at higher temperatures the sporothrix does not grow very well, but it resists very low temperatures quite satisfactorily.

In those localities where intensive growth of the fungus is favored by temperature and moisture, most of the infections are apt to take place.

The epidemiologic investigations of equine sporotrichosis in Pennsylvania have shown that sporadic cases only, are common. In 1910, twenty-four, in 1911, eleven, and in 1912, thirty-six cases were reported, but in no instance was more than one animal affected on the same premises. In this respect the disease differs widely from true "epizootic lymphangitis" which always spreads rapidly in a stable; according to Bridré, Nègre, and Trouette,[8] in Algiers, twenty-seven horses were infected in a stable of eighty-two. Apparently there is no seasonal incidence as in "epi-

equine strains used had been previously passed through the rat body. The susceptibility of guinea-pigs, rabbits, mice, etc., was very low for these strains. Apparently this difference did not exist for man. A laboratory infection which resulted from the handling of equine strains is ample proof of the danger which is connected with working with sporotricha.

The history of this infection is the following:

On April 15, 1913, I noticed on the dorsum close to the nail-bed of the third finger of the left hand a small ulcerated area. A formaldehyd eczema, which had healed very slowly, was thought to have been the source of a benign-bacterial infection, and accordingly the finger and hand were treated with mercuric chlorid and alcohol dressings. Iodin was also applied occasionally. No healing occurred, and by April 20 there appeared a round swelling on the middle of the ulnar side of the left arm, and on the internal surface of the humerus a large tumor, 6 by 3 cm., was felt. Soon afterward, on the middle of the dorsal side of

7. De Beurmann and Gougerot: Découverte du Sporotrichum Beurmanni dans la nature, Bull., et. mém. Soc. méd. d. hop. de Paris, 1908, No. 37, p. 733.

8. Bridré, Nègre and Trouette: Recherches sur la lymphangite épizootique en algérie, Ann. d. l'Institut. Pasteur, 1912, xxvi, p. 701.

9. Meyer, K. F., and Aird, J.: Various Sporotricha Differentiated by the Fermentation of Carbohydrates, Jour. Infect. Dis., 1915, xvi, p. 399.

the carpal joint a nodule, 3 by 3 cm., was noted, being well defined from the increased edema on the dorsum of the hand. Along the lymph vessels, as far as the elbow, numerous nodules—the size of small peas—developed, and by April 28 the cubital lymph node was about the size of a cherry. On the internal side of the second phalanx of the third finger, a small nodule—the size of a pea—was readily felt. These processes, which developed slowly, were absolutely painless. The large swelling on the upper arm felt uncomfortable and, on touch, somewhat tender; it was more a hindrance to the movement of the limb than anything else. No general symptoms of fever were noted, and I attended to my regular work without the slightest discomfort. By April 25 I had made the clinical diagnosis of sporotrichotic lymphangitis following a primary sporotrichotic ulcer on the third finger, the portal of entry being the dermal defects of the formaldehyd eczema.

By April 30 the gumma on the dorsum of the hand was slightly fluctuating and was lanced. Several loops of a serous, honey-like pus were pressed out. Microscopically, a few doubtful, gram-positive mycelia of a sporotrichum were noted, but by May 3 nine colonies of a typical sporothrix had developed in one tube.

Iodin treatment, which began April 25, was intensified, and for one and a half months daily from 4 to 6 grams of sodium iodid were taken internally. Sodium cacodylate and strychnin were used for two weeks. By May 21, the nodule on the dorsum of the hand was 1.5 by 1.5 cm.; the large swelling on the humerus was the size of a large cherry-stone. The lymphostasis had subsided, but a complete absorption of the nodules was not accomplished until the middle of July of the same year.

The serum gave the following reactions on the dates mentioned:

Date 1913	Agglutination*	Complement Fixation	Serum c.c.
April 30	1: 60	+	0.2
May 10	1:350	+	0.05
May 21	1:150	+	0.05
June 15	1: 60	+	0.1
November 10	1: 20	+	0.3

* Method of Widal, Abrami and Joltrain.[10]

An intradermal test with killed spores of a mixed suspension of sporotricha was positive on June 15, 1913. In December, 1913, various skin tests with streptothrices, were all negative.

This case represents a true laboratory infection, with cultures. For many weeks previous to the development of the ulcer on the third finger, no necropsies on animals had been carried out nor had I come in close contact with infected animals. Large Pasteur flasks with growing sporotricha were handled, in a living condition transferred from one flask to another and used for fixation and agglutination tests. According to my records, equine strains only were used at that time, so that this accidental infection is more or less in form of an experiment, proving the pathogenicity of the equine strains to man.

The laboratory infection is the second one in the United States. The infection of the case of Wilder and McCullough[11] probably resulted from human strains, but inasmuch as Mr. McCullough worked also with one of my equine cultures, the report of my case will perhaps be of more than personal interest.

I have already discussed the question of contagion in animal sporotrichosis and have mentioned that there is sufficient evidence on hand to conclude that contact infections between horses occur in rare instance only. One human case of direct contact infection in a family, described by Widal and Joltrain,[12] is known, but on the other hand the observation of Perkins[14] and others: that a mother with a large wound on her finger treated the sporotrichotic lesions of her child, are ample proof that the healthy body ordinarily resists a sporotrichotic infection, even when the contamination with organisms contained in the pus is a severe one. The suppuration from the lesions was extensive and it seems impossible to assume that the organisms contained therein did not enter into the unbandaged wound of the mother's hand.

The contact infections between animals and man, on the other hand, deserve detailed consideration, particularly when one realizes how widely distributed animal sporotrichosis is in the United States as compared with France, where the disease exists endemically without there being any evidence that horses or other animals are spontaneously infected.

Animal sporotrichosis has been observed to occur spontaneously in the following countries and has been described by the following writers:

In horses: Madagascar (Carougeau[15]); United States (Pearson;[2] Page, Frothingham and Paige;[4] Fischer;[3] Mohler;[5] Sutton[16] and K. F. Meyer).

In dogs: France (Gougerot and Caraven[17]); United States (K. F. Meyer).

In rats: Brazil (Lutz and Splendore[18]); France (Jeanselme and P. Chevalier[19]).

In addition to these reports, numerous instances are cited in the literature in which the infection was probably carried from animals to man by their bites or hides.

Rouslacroix[20] reports a case of sporotrichosis as the result of a dog bite; Sutton's[21] case was due to a hen bite, and another case of Rouslacroix[22] was attributed to a parrot bite. Rispal and Dalous[23] describe a case of sporotrichosis following the bite of a horse. Olson[24] accuses gophers; Stickney[25] suspects hides, and Quain[25] a tuberculosis-like infection in a heifer. These cases could doubtless be increased in number, because in one case of R. L. Sutton's[21] the primary trauma and portal

10. Widal, Abrami and Joltrain: Séro diagnostic mycosique, Ann. d. l'Institut. Pasteur, 1910, xxiv, p. 1.

11. Wilder, W. H., and McCullough, Clifford, P.: Sporotrichosis of the Eye, THE JOURNAL A. M. A., April 11, 1914, p. 1156.

13. Widal and Joltrain: Sporotrichose chez membres d'une même famille, Bull. et mém. Soc. méd. d. hôp. de Paris, 1908, No. 36, p. 647.

14. Perkins, in De Beurmann and Gougerot: Les sporotrichoses Paris, 1912, p. 224.

15. Carougeau: Sur une nouvelle mycose sous-cutanée des équidés, Jour. d. méd. vét. et. d. Zootech., January, February, March, 1909, pp. 8, 75, 148.

16. Sutton, R. L.: Sporotrichosis in Man and in the Horse, Boston Med. and Surg. Jour., 1911, clxiv, p. 179.

17. Gougerot and Caraven: Sporotrichose spontanée du chien, Presse méd., 1908, No. 43, p. 337.

18. Lutz and Splendore: Ueber eine bei Menschen und Ratten beobachtete Mycose, Centralbl. f. Bakteriol., 1907, xlv, p. 631.

19. Jeanselme and Chevalier: Transmission de la sporotrichose à l'homme par les morsures d'un rat blanc, Bull. et. mém. Soc. méd. d. hôp. de Paris, 1911, No. 10, p. 287.

20. Rouslacroix, in de Beurmann and Gougerot: Les sporotrichoses, Paris, 1912, p. 278.

21. Sutton, R. L.: Sporotrichosis in America, THE JOURNAL A. M. A., Dec. 24, 1910, p. 2213.

22. Rouslacroix, in de Beurmann and Gougerot: Les sporotrichose des animaux, Rev. gen. de. méd. vét., 1913, xxi, p. 557.

23. Rispal and Dalous: Deux cas de sporotrichose, Ann. de dermat. et de syph., 1909, No. 12, p. 689.

24. Olson, G. M.: A Case of Sporotrichosis in North Dakota, THE JOURNAL A. M. A., Sept. 21, 1912, p. 941.

25. Stickney and Quain: Discussion of the Article of Gustav F. Ruediger and Miller: Sporotrichosis in North Dakota, Jour. Minnesota Med. Assn., 1911, xxxi, 512.

of entry were acquired through a dog bite when feeding kaffir corn to a pet. In every instance the animals were not visibly infected, and in the case of Sutton the kaffir corn could just as well have been contaminated with the spores of the sporotrichum as the saliva or teeth of the dog. My observations, in finding sporotricha in the mouth cavity of an apparently normal horse, explain the case of Rispal and Dalous in which the horse bite caused sporotrichosis in a draughtsman.

It cannot be denied that animals will act as passive carriers of sporotricha. Their mouth cavities, skin and hair, being soiled with vegetable matter, can carry the organism for a long period, and even a multiplication of the sporotricha can take place. I cultivated sporotricha from the skin and hairs collected from two horses associated with sporotrichotic animals in isolation stables where such animals had been kept for several years.

Lutz and Splendore[18] and Gougerot[26] had previously found the same conditions existing in rats, rabbits and cats. Such passive carriers, which mostly act as such temporarily, are, in their importance, similar to insects. In one experiment I observed that ordinary house flies (musca domestica) having fed on sporotrichotic organs of a rat, could infect Sabouraud's plates with sporothrix spores three days after contact with the infected material, and after death the spores remained alive, on the cadavers, for over twenty days (longest period tested).

It appears possible, therefore, that various agents, animals not excluded, can act as vehicles of the sporotricha in a manner similar to that found in many other diseases. This condition is, perhaps, the more apparent in sporotricha because it is a disease of the rural surroundings, and livestock on farms are more apt to come in contact with the spores than any other possible transmitter.

The aspect concerning the importance of animals as active or principal carriers is entirely different, however. As I have pointed out, such infections occur in considerable numbers, and when studying superficially the accompanying map, on which I have shaded the states in which equine sporotrichosis has been recorded, one notices that practically in the same states in which numerous cases of human sporotrichosis have been observed, animal infections are found. Although the information available is very meager, I judge through personal communications that the extent is even a larger one, and I am of the opinion that in Ohio, North Dakota, Kansas and Missouri, numerous cases of equine sporotrichosis occur, annually, which are not properly recognized and, therefore, are not reported.

In Pennsylvania the number of cases per annum has gradually decreased since 1907, until only 20 cases were reported in 1913; of these 20, 16 were diagnosed by cultures or serum tests. In 1912, when my attention was called to the detection of such cases, only 36 were found. Most of the cases I have seen, personally, in the northwestern part of the state, and I was very anxious to find out if any human cases had ever been the result of handling such horses.

When making a survey of Jefferson County, for human infections, in 1912, I found one case which at the beginning appeared to be a contact infection from a horse. The history of the case is the following:

26. De Beurmann and Gougerot: Les sporotrichoses hypodermiques, Ann. de dermat. et de syph., 1906, p. 1005.

FIRST CASE OF SPOROTRICHOSIS OBSERVED AND BACTERIOLOGICALLY PROVED, IN PENNSYLVANIA

History.—At the beginning of April, 1912, E. B., aged 16, a native of Strattonville, Jefferson County, Pennsylvania, observed on the index finger of his left hand a small "pimple" which developed later into a small, irregular ulcer. He remembered having had a small cut on this finger and having treated a horse which suffered from so-called "hives" on the hind legs. In the following months the ulcer became enlarged, and, along the finger and arm, numerous small, hard nodules developed which softened only after from two to three weeks, some discharging a viscid, thin pus. The treatment advised by Dr. A. Ray McNeil, Westville, Pa., consisted in cauterization with phenol and general antiseptic dressings.

Examination, July 1, 1912.—The patient is strongly built; is in perfect physical condition; shows no signs of undernutrition; has no elevation of temperature; the mucous membrane of the throat and pharynx are normal; on the dorsum of the second and third phalanx of the left index finger is an irregular ulcer, about 1.5 cm. in diameter; two days previously it was burnt out with phenol and shows fresh granulations which bleed freely. The edges are slightly undermined and some small pockets contain necrotic tissue. The surrounding skin is thickened and reddish blue. On the thumb a small ulcer, the size of a penny, with a grayish ground and bluish edges, lies in an indurated area of skin. On the dorsum of the finger and palm are a few hard nodules, the size of a pea. All around the metacarpeal joint a few hard and soft nodules are felt. On the inner and outer surfaces of the forearm, numerous reddish-brown and also bluish discolored areas are noted. Some are distinct nodules; some are flattened, covered by bluish skin and represent small abscesses in the subcutis. The lymphatics are hardened, enlarged and contain numerous nodules of various sizes. None of these nodules is soft. On the forearm one bluish, discolored area shows distinct cicatrization. According to the patient, this abscess had spontaneously discharged a small amount of pus. The cubital lymph node is hard, the size of a large cherry. The axillary lymph node is slightly enlarged and tender on compression. The nodules are indolent and cold. The bluish, discolored, soft areas are very tender to the touch. The subcutaneous nodules are confined to the course of the lymphatics. One of the small abscesses on the inner surface of the forearm was lanced; a reddish, stringy, honey-like pus exuded, but by pressing on the lymphatics on the upper arm, about 10 c.c. of the same pus escaped freely.

Smears of the pus showed mostly polymorphonuclear leukocytes and a few mononuclear cells; no mycelia could be detected after prolonged search. The culture tubes of Sabouraud's glucose agar, inoculated with the pus and carried close to the body, showed, three days afterward, from 10 to 15 typical colonies of the *Sporotrichum schencki-beurmanni.* Cultures from the tonsils and pharynx revealed no sporotricha. The serum of the patient gave the following reactions:

Wassermann, with guinea-pig's heart: negative.

Agglutination of sporothrix spores, grown and handled according to Widal, Abrami and Joltrain: 1:500.

Complement fixation: positive with 0.2 c.c. serum.

I immediately advised Dr. McNeil of my findings and diagnosis, and suggested treatment with potassium iodid.

On July 30 I again saw the patient. The ulcers were completely covered with dry skin. There were still a few nodules, the size of a pea or a pinhead, to be felt along the inner and outer surfaces of the forearm. Seven bluish-red, cup-like, contracted scars were seen on the forearm. The lymph vessels were fine and were only indicated by the nodules, the size of a small pea. The lymph nodes were small. According to a letter from the father of the patient, complete recovery was achieved in the course of eight weeks. In a letter dated December, 1913, the patient informed me that he was in perfect health.

This case is of interest in two respects, namely: 1. It is the first authentic case observed and studied in

Pennsylvania. There is no doubt but that the infection was contracted in Strattonville where the boy was born as he had not left the village for three years prior to his illness. The case developed in a locality where, according to our knowledge, sporotrichosis in animals is common (eight cases reported in Jefferson County in 1912). 2. According to the father and the patient, the infection was contracted from a horse suffering from "hives." This term implies in the mind of the farmer that the horse was affected by eczema or a similar infection. Having my interest directed toward such cases, I was particularly anxious to prove my suspicions. A careful examination of the horse revealed that the animal had probably been affected with a form of eczema. The skin was hypertrophic and scaly, and along the coronary band decidedly scarred, but no nodules or distended lymph vessels or hypertrophy of the subcutis—the signs of latent or healed sporotrichosis—could be found. The blood serum examined for immune bodies—a procedure which, in my experience, permits a retrospective diagnosis if that animal was previously affected with sporotrichosis—gave negative results.

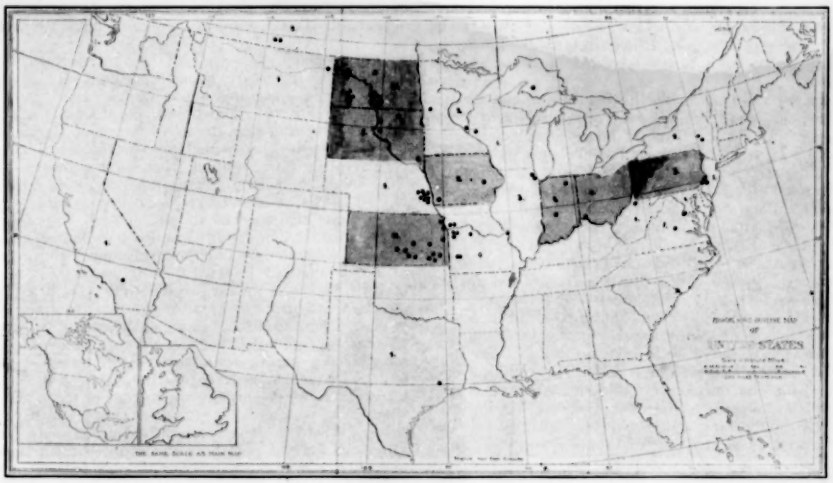
Several samples of the scales and hair of the horse, examined culturally, three months after the infection had occurred, did not demonstrate the presence of sporotricha, and the suspicion that the horse was, perhaps, a passive carrier, was not well supported.

In the light of these findings, the infection of the boy at Strattonville, Pa., doubtless was not due to a contact infection with an active animal sporothrix carrier. To suspect that the horse was a passive carrier at the time the infection took place is reasonable, but the circumstances for the infection were just as favorable for other agents, like soil or other material, containing the spores which entered the body of the young farmer by way of the small cut on his index finger. The trauma was responsible, in the first place; hence any direct association with the horse is rather far-fetched, in my opinion, in a rural region where probably the water, the sponge, the brush, etc., used for treatment of the animal, were contaminated with sporotricha.

If direct contact with infected horses were the cause of sporotrichosis in man, more cases would undoubtedly have occurred in the northwestern part of Pennsylvania, where hundreds of horses have been handled, treated and necropsied by veterinarians and farmers. The case reported is the only one in that section of the state. It is possible that the case of Haynes and Cherry,[27] reported from West Virginia, is another human case contracted in the Ohio-Allegheny belt of sporotrichosis.

The second case on record in Pennsylvania, reported in 1913 by Miller,[28] was contracted in Philadelphia by a man handling tin cans. The cut was the portal of entry for the sporothrix. From a comparative viewpoint, his case proves that sporotricha exist in Philadelphia and surroundings. The case in a dog and three cases in horses, all in the city of Philadelphia, were never satisfactorily explained as to their origin of infection. Until 1912 much support was given to the idea that the animals contracted the disease in the western part of the state and that probably an undetected, endemic focus existed in Philadelphia, due to such outside infections. Inasmuch as, recently, cases of equine sporotrichosis unquestionably developed in Lancaster and Montgomery counties, and Miller's case originated in Philadelphia, these cases are now better explained.

These and other facts gathered in Pennsylvania make it now imperative to investigate whether sporotrichosis in man, reported in this country and abroad,



Geographic distribution of sporotrichosis.

27. Haynes, R. H., and Cherry, S. L.: Case of Sporotrichosis, West Virginia Med. Jour., March, 1915, ix, 303.
28. Miller: Sporotrichosis, Ann. Surg., 1913, lviii, 540.

is actually proved to be a contact infection from diseased animals.

Full credit should be given to Hyde and Davis[29] in having suggested the possibility of human infections from horses affected with sporotrichosis. In their case a transmission of the "unknown disease" from the horses to the patient in North Dakota is, however, very improbable for many reasons.

In the first place, my studies have revealed that the mortality from sporotrichosis is very low and, in the second place, so far no cases of nasal sporotrichosis have been observed or recorded in the United States. The description given by Carougeau[15] for cases of nasal sporotrichosis in Madagascar corresponds more with true epizootic lymphangitis than the other malady.

In my opinion, the disease among the horses in North Dakota, with which Hyde and Davis associate their human infection, was farcy and not sporotrichosis. This view has also been expressed by several residents of North Dakota whom I interviewed concerning these cases. It is unfortunate that this disease of the horse has not been studied bacteriologically.

In the third place, the history of the human case states that the patient could not remember having come in contact with the diseased horses of a neighboring farm. In what manner contact took place, however, is not described by Hyde and Davis. Inasmuch as sporotrichosis is not contagious, the presence of infected horses on a farm cannot be made any more responsible for the infection than biting insects or vegetables which are well known to be passive carriers, particularly in North Dakota where the largest number of sporotrichosis cases has been contracted by the usual channels of wound infection. Personally, I do not think that, in this case, contact infection is proved.

In the case of sporotrichosis reported by Richard L. Sutton,[16] a diseased horse is mentioned as being indirectly responsible for the infection. The clinical data concerning the horse correspond in many respects with our knowledge of equine sporotrichosis, but unfortunately no bacteriologic proof is available, and our information concerning animal sporotrichosis in Kansas is limited. It is not stated that the baling-wire with which the patient injured his hand, or that part of the manger which the farmer repaired, had been soiled with pus from a diseased horse. Also, in this case, the circumstances leading to the infection can be explained in other ways. In my opinion, the connection between horse and man is better established than any other case on record—but it is in no way conclusive.

The only true contact infection proved bacteriologically is the observation by Carougeau[30] in Madagascar. A veterinarian punctured his hand when operating on a mule affected with sporotrichosis.

In the table the cases of sporotrichosis observed since 1898 are given, including all of the cases reported to the end of May, 1915. The summaries of Hamburger[31] and Ruediger[32] have been enhanced by the reports of Cooke,[33] Ravogli,[34] R. L. Sutton,[35] Rhamy and Carey,[36] Adams,[37] Newmann,[38] Dermody and McMartin,[39] Miller,[28] B. F. Davis,[40] Wilder and McCullough,[11] Simpson,[41] Haynes and Cherry,[27] Albert and Grover,[42] and McGavock,[43] in the United States; and G. E. Learmonth[44] in Canada.

The cases of Cooke, Haynes and Cherry, Simpson, McGavock, etc., are particularly valuable, because the evidence collected demonstrates the wide distribution of sporotrichosis in the United States. A total of eighty-two cases (and one additional case, reported by Wolbach, origin of infection and details not known to me) has so far been reported; two new cases in Pennsylvania and two in Canada are here included. Of these cases, fifty were diagnosed by culture tests; in twenty states the disease has been observed, and probably in most of the cases originated there. Apparently in those communities where the interest was aroused by some physicians, more cases have been recorded than elsewhere. Across the North Dakota border, in Alberta, Canada, two cases have also been seen.

Out of about 400 cases of human sporotrichosis described in the international literature, only one or two cases (Carougeau's and Sutton's cases) can be connected with cases of equine sporotrichosis. This fact, and the evidence discussed herein in detail, do not support the theory that human sporotrichosis is very frequently transmitted from horse to man.

If other animals play an important rôle in the United States, it has not yet been demonstrated. So far, no rats examined by the writer have been found to be infected. In South America one human infection was attributed by Lutz and Splendore[45] to the bite of a spontaneously infected rat. It would be exceedingly valuable if investigations were conducted to ascertain whether gophers or ground squirrels in regions where sporotrichosis is common, can spontaneously contract this mycosis. Dogs, cats and horses can probably harbor sporotricha in the mouth cavity and, as I have demonstrated for the dog, also be active transmitters of the organisms, so that in those states where sporotrichosis is common, proper attention should be paid to bite wounds from such animals. The same can be said regarding the injuries from birds, like parrots and chickens, even though neither spontaneous nor experimental infections have been successfully demonstrated in them. Their beaks, soiled with spores, can act as vehicles of transmission. The cases of Sutton[21] and Rouslacroix[22] are sufficient proof.

Bovine animals are not susceptible to sporotrichosis, according to some of my experiments. On the other

29. Hyde and Davis: Sporotrichosis in Man, Jour. Cutan. Dis., 1910, xxviii, 321.

30. Carougeau: Premier cas africain de sporotrichose de de Beurmann, transmission de la sporotrichose du mulet à l'homme, Bull. et mém. Soc. méd. d. hôp. de Paris, 1909, No. 34, p. 507.

31. Hamburger, Walter W.: Sporotrichosis in Man, THE JOURNAL A. M. A., Nov. 2, 1912, p. 1590.

32. Ruediger, Gustav F.: Sporotrichosis in the United States, Jour. Infect. Dis., 1912, ii, 193.

33. Cooke: Texas Med. Jour., 1914, lx, 190.

34. Ravogli: Lancet-Clinic, Aug. 2, 1913.

35. Sutton, Richard L.: The Occasional Clinical Resemblance of Blastomycosis and Syphilis to Sporotrichosis, THE JOURNAL A. M. A., Jan. 11, 1913, p. 115; Sporotrichosis in the Mississippi Basin, ibid., Oct. 3, 1914, p. 1153.

36. Rhamy and Carey: Jour. Indiana State Med. Assn., p. 274.

37. Adams, G. S.: Another Case of Sporotrichal Infection in Man, THE JOURNAL A. M. A., June 7, 1913, p. 1784.

38. Newmann: Western Med. Rev., 1912, p. 646.

39. Dermody, L. A., and McMartin, C.: A Case of Sporotrichosis, THE JOURNAL A. M. A., Sept. 19, 1914, p. 1028.

40. Davis, B. F.: A Case of Sporotrichosis, Surg., Gynec. and Obst., 1914, xix, 490.

41. Simpson, C. A.: Cutaneous Sporotrichosis, Washington Med. Ann., 1915, xiv, 79.

42. Albert, H., and Grover, A. L.: Sporotrichosis, Iowa Med. Jour., 1913, xix, No. 9.

43. McGavock, E. P.: Sporotrichosis (?), Old Dominion Jour. Med. and Surg., 1914, xix, 132.

44. Learmonth, G. E.: Sporothrix Bearing Some Resemblance to Sporotrix Beurmanni, Canadian Med. Assn. Jour., 1915, v, 32.

45. Splendore: Sporotrichoses americ.nas, Brazil Med., 1909, xxiii, 361.

hand, the hides can probably act as transmitters of spores, like any other agricultural product.

CONCLUSIONS

Spontaneous sporotrichosis of domesticated animals, particularly horses, is very common in certain parts of the United States.

Extensive bacteriologic, serologic experiments have proved the identity of the causative organisms in human and animal sporotrichosis. The pathogenicity for human beings was observed in an accidental laboratory infection.

The geographic distribution of equine sporotrichosis, which is apparently closely connected with certain telluric and climatic conditions, covers, in two states, the same territories from which numerous cases of human infection have been reported in the last five years. In Pennsylvania, equine sporotrichosis—as so-called "epizootic lymphangitis"—has been noted in as many as 150 cases annually.

Only two human cases are on record in that state. A careful study of one case suggested at first a contact infection with a sporotrichotic horse, but this assumption could not be proved conclusively. The evidence collected does not support the theory that human sporotrichosis is very frequently transmitted from horse to man in the United States. The cases of Hyde and Davis, Sutton and others are discussed from this point of view, and compared with the cases reported by Gougerot, Carougeau, Lutz and Splendore, and Rouslacroix.

The absence of sporotrichosis among veterinarians and farmers in Pennsylvania—where equine sporotrichosis is so exceedingly common and so often treated, calling forth undoubtedly close contact with infectious material—demonstrates that sporotrichotic infections in man are established by this channel of contact in rare instances only.

Second Street and Parnassus Avenue.

THE RECENT METHODS OF TREATING DIPHTHERIA *

FRANK C. NEFF, M.D.

KANSAS CITY, MO.

Wide publicity has been given in America during the past year to Schick's discovery of the skin reaction to diphtheria toxin. This reaction is of interest in the treatment of exposed individuals because of its bearing on the practice of passive immunization.

Schick[1] in 1913 published his conclusions and results, which I summarize as follows:

Diphtheritic children before a serum injection possess no protection bodies against the toxin of diphtheria. The prophylactic use of antitoxic serum supplies this lack. Many individuals without ever having shown symptoms of a diphtheria infection, already possess antibodies: in the new-born, 80 per cent.; older children, up to 50 and 60 per cent., and adults, up to 90 per cent. Children 2 to 5 years of age gave the highest percentage of positive reactions. For a great number of persons, therefore, the prophylactic injection could be abandoned.

Schick finally adopted 0.1 c.c. of a 1:1,000 dilution of the toxin (computed to 1/50 of the single lethal dose for a 250-gm. guinea-pig) as the quantity to be injected within the skin. With a successful injection, one sees immediately a white, wheal-like elevation with a punctate design corresponding to the mouths of the hair follicles. Following the central infiltration of the toxin solution, there usually develops in from twenty-four to forty-eight hours a somewhat lighter red areola which, after a further twenty-four to forty-eight hours, fades without pigmentation. There remains, then, the central part, distinguishable through its pigmentation, so that in the later stages the area of the central infiltration corresponds to the diameter of the pigmented part of the skin. At the end of one week the scaling and pigmentation are characteristic. An inflammatory reaction at the site of injection occurs in some individuals in spite of antitoxin content of their blood. Definite conclusions then can only be drawn by the negative outcome of the reaction, which proves the presence of antibodies in sufficient quantity for prophylaxis.

The reaction, then, is due to the direct irritant action of the toxin in the skin; little or no antitoxin in the blood fails to neutralize the toxin injected. The negative reaction indicates that the toxin has been neutralized.

All exposed children in an institution are tested with diphtheria toxin. After twenty-four hours those reacting positively get an immunizing dose of serum, the negative ones do not. This saves a great number of persons the injection of serum with its discomfort, sensitization and expense.

At the Gilliss Orphans' Home in Kansas City, the test was made on eighty-one children following the development of several cases of diphtheria in the institution during November, 1914. The outcome of the test was recorded on each child's record and those reacting positively were isolated and closely watched. Fortunately no new cases developed at that time. One girl who gave a negative reaction on November 14 developed diphtheria four weeks later, which demonstrated the truth of Schick's assertion that the immunity of the individual against diphtheria may from some cause be changed. It is a clinical fact observed in diphtheria hospitals that nurses who go on service without sufficient rest or when reduced in health show less resistance than at other times.

When a child with the disease has been admitted to the hospital we have, when possible, brought in the other members of the family for inspection and culture, administered the Schick test and at the end of twenty-four hours immunized the ones reacting positively.

We had an interesting confirmation of the fact that few new-born infants react to diphtheria toxin, in the testing of sixty-five infants, forty-four of whom were under 1 month of age, and only two as old as 5 months. Only one of these sixty-five, a child 13 days old, reacted positively.

Sufficiently large numbers of observations have been made and published to show that a negative reaction shortly after exposure is of practical use as an index of the individual's lack of susceptibility at that particular time, and makes unnecessary a prophylactic injection of serum.

EARLY DIAGNOSIS OF DIPHTHERIA

Nowhere probably is an early diagnosis of more importance than in diphtheria. Reiche[2] has just reported that the mortality increased in 6,250 cases

* Read before the Section on Diseases of Children at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Schick, B.: Die Diphtherietoxin-Hautreaction des Menschen als Vorprobe der prophylaktischen Diphtheriheilserum-injektion, München. med. Wchnschr., Nov. 25, 1913, p. 2608.

2. Reiche, F.: Ztschr. f. klin. Med., 1915, Parts 3 and 4.

in the Hamburg epidemic according to the day of the disease on which the serum was received, from 4.4 per cent. the first day to 33.6 per cent. on the seventh day.

Typical cases are diagnosed clinically fairly early, but we have come more and more to the conclusion that many cases of diphtheria cannot be diagnosed except by the microscope. Such cases are often the nasal, laryngeal and atypical tonsillar ones. The practice of waiting twenty-four hours for a culture is now no longer necessary, for twelve hours at the most is sufficient. Clinical diphtheria should be injected without waiting, though it is usually possible by immediate smear to confirm fairly accurately the diagnosis. Light swabbing of a membrane is often inconclusive, but deep scraping of the membrane with a swab or curet until bleeding occurs makes it possible to obtain the Kiebs-Loeffler bacillus for immediate recognition on the coverglass with Ponder's stain. Antitoxin is administered at once and the culture a few hours later is examined for confirmation.

Fig. 1.—Diphtheria skin reaction forty-eight hours after injection of toxin.

METHODS OF ADMINISTRATION AND DOSAGE OF ANTITOXIN

Mild cases of diphtheria injected early have, in the experience of most men, responded uniformly well to subcutaneous injection. In the past, however, not sufficient antitoxin has been given at the first dose, especially when several days have elapsed before treatment was begun; the administration of the serum was distributed over several days, with ineffectual and useless repetitions; therefore the dosage and the most efficient method of administration become questions of great importance.

TABLE 1.—DIPHTHERIA CASES AT ISOLATION DEPARTMENT, KANSAS CITY GENERAL HOSPITAL, FOR NINE MONTHS, 1914-1915

Age	No. of Cases	Average Units in Recovered Cases		Number of Deaths
		Mild	Severe and Late	
Under 12 months	3	2,000	23,000*	1
12 months to 5 years	46	4,400	9,400	6
6 to 10 years	47	5,100	10,700	2
11 to 14 years	17	6,100	8,100	0
15 years and over	42	8,500	12,000	0
Total	155			9

* One case.

The mortality among the 113 children was 7.9 per cent. Total mortality was 5.8 per cent. Average day of the disease when fatal cases received first dose of serum was the third. Average number of units received on first day of treatment in fatal cases was 6,100. Four of the nine deaths occurred within twenty-four hours of admission to hospital.

Morgenroth of Berlin, in 1907, was the first to show the relative rapidity with which antitoxin is absorbed when injected subcutaneously, intramuscularly and intravenously. Four hours after the injection, the antitoxin in the blood following intramuscular use is five to twenty times as much as after subcutaneous injection.

TABLE 2.—SERUM INJECTIONS

Method of Administration	Subcutaneous	Intramuscular	Intravenous
Number of cases	63	46	89
Cases receiving only one injection, per cent.	63.4	66	62
Reactions appearing immediately after injection	2	2	14
Average time until three negative cultures, days	21.9	18.5	19

Total injections, 198.
Number of cases of serum sickness, 24.
Percentage of serum sickness, 15.
Average number of serum injections per case, 1.2.

Rolleston[3] is an advocate of the exclusive intramuscular use of antitoxin, believing that it is more rapidly absorbed and less rapidly excreted. The number of his injections averaged only 1.2 per cent.

Ganghofner[4] advocates intramuscular in preference to the subcutaneous injection of serum because of the much more rapid absorption of the serum, and because it is as easily performed and with less pain.

For immediate neutralization of the toxin the intravenous is probably the most rapid. Morgenroth states that the amount of antitoxin in the blood just after intravenous injection is the greatest. Park[5] has demonstrated the fourfold efficiency of serum introduced directly into the blood stream. The method is no longer in the experimental stage as the literature shows. Kausch[6] believes that the caution previously held by the profession concerning intravenous injection is unfounded. In the hands of the inexperienced, the technic is more difficult, but there is no reason for expecting a greater danger from infection.

Fig. 2.—Skin reaction one week after toxin injection.

Successfully introducing serum into a vein of any child is not a difficult thing as a rule. The veins of the arm, the scalp or the neck are preferred, in the order named. Nor is there danger from an immediate general serum reaction in young children, a fact which has been proved by the extensive observations of Park. Antitoxin must be used in diphtheria, and in many cases it is necessary to get the greatest possible benefit from it.

3. Rolleston and Macleod: Intramuscular Injection of Antitoxine in Treatment of Diphtheria, Brit. Jour. Child. Dis., July, 1914.
4. Ganghofner: Prag. med. Wchnschr., 1913, xxxviii, 565.
5. Park: Boston Med. and Surg. Jour., Jan. 16, 1913.
6. Kausch: Deutsch. med. Wchnschr., 1913, No. 48.

Hence reactions are not contraindications to serum use.

The dosage of antitoxin must of course be governed by the severity of the case, and by the length of time the disease has existed when the patient comes for treatment. It is probable, also, that the weight of the individual should enter into the question of dosage, in order that sufficient antitoxin may be introduced into the blood stream to give the necessary concentration. There is no objection, except expense, to the maximum dose necessary to safeguard the individual. Park states that a thousand times as much antitoxin is given as is required for the amount of toxin, to reach the tissue which has been damaged by the toxin.

The tabulation of our hospital cases since Sept. 1, 1914, is shown in Table 1.

COMMENT

There were only three infants under 12 months of age. One of these received enormous doses of antitoxin. This amount is excluded in making up the average administered in all cases.

In spite of the greater severity of the disease, as a rule, where the intravenous injection was employed, the number of units received was practically no greater than in the milder cases. In order to be sure that cases received enough antitoxin for a cure, more was given, probably, in certain mild cases than was needed. The average shows that our milder cases received 6,000 units and the severe and late cases 10,000 units. It has been our effort to give in one dose sufficient antitoxin for the entire course of the disease. The number of injections, however, was 1.2 per case.

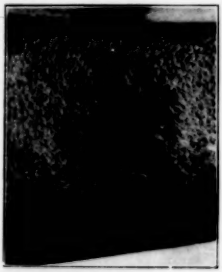


Fig. 3.—Appearance of reaction in negro child at end of two weeks.

CONCLUSIONS

While in a general way it is accepted that diphtheria should be diagnosed and treated at the earliest moment, it is shown by our hospital cases at admission that much time has been lost. Of more importance than serum dosage or its method of use is the institution of treatment early in the first day of sickness.

In order to avoid the delay that frequently exists while a diagnosis is being made, we suggest that the municipal health board and hospital extend its emergency service to include the immediate distribution and collection of culture tubes and swabs, making it possible in clinically positive as well as in doubtful cases to administer the serum within a few hours.

Smears should be examined immediately in all cases, and antitoxin administered at once if microscopically or clinically positive. Cultures should be reported on within twelve hours if possible.

Serum should be given at the earliest period within the first twenty-four hours. As it has been proved that the intramuscular injection gives more rapid and efficient results, and as it is practically as easy of administration as the subcutaneous, there is no reason why subcutaneous serum injection in diphtheria should not be abandoned. Intravenous injection gives less discomfort than any other method, if those cases having reactions are excepted. We found no contraindications to its use beyond the occasional difficulty in finding a vein, and we shall continue to use it as the method of choice in severe and late cases.

ABSTRACT OF DISCUSSION

DR. JOHN ZAHORSKY, St. Louis: An epidemic of diphtheria in St. Louis last winter assumed some of the most toxic forms I have ever seen. We tried all the methods of making the injections, cutaneous, intramuscular, and intravenous, and found that the intravenous was not always practicable on account of the reaction. In serious and neglected cases it is often necessary to adopt the intravenous method. As to the relative value of the subcutaneous and intramuscular methods, I am as yet not decided. In a case of moderate severity there is a time when the pseudomembrane just after the administration of antitoxin, for a few hours shows a furious increase in growth. This may go on for five or six hours and the whole throat become involved. What has the antitoxin done? It has lowered the resistance temporarily. Can we stop this spread better by the intramuscular injection than by the subcutaneous? It seems to me that the time of the spread is shortened by the intramuscular injection. Much of the serum on the market is not perfectly clear; it has small particles which it ought not to have and I would be afraid to use it for fear it might do some harm. There ought to be some way of filtering it to remove such particles. Again, there is some discomfort associated with the administration of the intramuscular injections, so in my cases I prefer the subcutaneous if the circulation is good, the pulse good and there is no lymphadenopathy; but if the circulation is poor, the limbs cold and the child pale, we must not depend on a subcutaneous injection but must resort to the intramuscular injection.

DR. LANGLEY PORTER, San Francisco: I would like to ask Dr. Neff what were his results with the Schick reaction in respect to sloughing, and what were the results of the doses of antitoxin he gave in laryngeal diphtheria?

DR. ARTHUR A. O'NEIL, San Francisco: The paper does not agree with what we have found with reference to diphtheria in San Francisco. In San Francisco the cases are not recognized so early and indeed, many cases are moribund when we see them. In our cases the small amounts of antitoxin advocated by Park do not seem applicable. In laryngeal diphtheria we give sixty thousand units and repeat it up to 310 thousand units and those patients have been saved. I wonder at the statements made that patients can be saved with the small amounts that have been spoken of. We give the antitoxin intravenously or intramuscularly and usually in massive doses, forty or sixty thousand units at a time. Even with these large doses the mortality is from 12 to 15 per cent. I have yet to be convinced of the advantages of giving small doses. I believe in giving massive doses and giving them frequently. As to anaphylaxis, I have seen it occur in only one case.

DR. HENRY D. CHAPIN, New York: I think it is unsafe to argue from institutional work that we will find the same things in private practice. I have tried both large and small doses of antitoxin and I have found an average dose as effective as the very large doses, and I cannot understand why the very large doses are necessary. In institutions we get the late and bad cases. I do not think it is safe to let it go forth that we favor these large doses, or that such large doses as mentioned in the paper help us in our work.

DR. JESSE M. MCGAVIN, Portland, Ore.: I agree with Dr. Chapin regarding large doses of antitoxin. In 1908 in Vienna Dr. Pirquet did not give large doses even in the laryngeal cases. I would like to ask if any one here has had experience with Vincent's angina, and if they have used diphtheria antitoxin in these cases. I have had cases in which they looked, as far as the membrane and clinical

symptoms were concerned, like diphtheria but the spirillum was found. These cases proved very obstinate to treatment and I should like to know the experience of others in the use of antitoxin in these membranous origins.

DR. JOHN A. COLLIVER, Los Angeles: It should be mentioned that there is a pseudoreaction that may be mistaken for the true reaction unless one understands the difference. It is usually indurated and disappears in about twenty-four hours. In Professor Pirquet's Kinderklinik I saw Docent Schick working on another method of making his test. It is somewhat similar to the von Pirquet tuberculin test. This method eliminates the pain that is incident to the ordinary Schick intradermal method. The drill is used in the same way as in making the tuberculin test. Smaller doses of antitoxin are used there than have been mentioned here. The body weight plays an important part.

DR. W. W. BEHLOW, San Francisco: I disagree with Dr. Chapin and Dr. McGavin and agree with Dr. O'Neil with regard to the large doses of antitoxin. I have observed the disease both here and in Boston. In Boston the small doses were used for years, but they did not bring the results that had been shown from the large doses that have been used in recent years. If the small doses did the work, why was it that after using them for several years in the Boston City Hospital they abandoned them for larger doses? The children were not being saved by the small doses. Then Dr. McCollum and Dr. Place increased the doses several thousand units before the patients got well. Why is it that small doses give good results in the hands of some men while in the hands of others they do not?

DR. W. P. LUCAS, San Francisco: In regard to the Schick reaction, the reader did not say anything about the pseudoreaction. In some cases we find a reaction that disappears within twenty-four hours. In some of these reactions there is considerable infiltration, but they may be distinguished from the true reaction by the fact that they disappear at the end of forty-eight hours. In some cases, even with a moderate reaction, I have seen necrosis. I have made the test in over 400 children in the last few months and 21 per cent. showed some necrosis. There were none due to infection, cultures being sterile. In a few cases large sized blebs formed, which broke down and became necrotic. These usually healed readily. In many cases the reaction remained two or three weeks. In positive cases there will be marked redness at the end of twenty-four hours. In institutions it is important to know when to make the inspection, whether it is better at the end of forty-eight hours or at the end of seventy-two. If we can know this it will be that much time saved. In institutions we have cultures of the throat made at the same time as the Schick test. If we find that we have 50 to 65 per cent. of positive tests, that eliminates one-third of the work, since the negative cases will not have to be watched. Only those reacting positively are given antitoxin. If one has children in institutions or in schools where they can be watched closely, it may not be necessary to give antitoxin.

DR. FRANK C. NEFF, Kansas City: I do not think there is anything in my paper that would indicate that I advocate small doses. An average early dose of 6,000 units in children who have a mild case and of 10,000 units in severe cases constitutes fairly large amounts for single doses. As brought out by Park and Schick, the dose should be an adequate one, sufficient to counteract all the toxins, given as early as possible and at one time. So far as the pseudoreaction is concerned, I did not mention it as a pseudoreaction, but I spoke of it as an anaphylactic or inflammatory reaction that disappears in the course of the first forty-eight hours. Schick found that he had some sloughing with stronger solutions of antitoxin, but with greater dilutions he did not get it. I have seen only one case of sloughing in 500 injections, and I believe that an overdose of the solution was injected in this case.

I have never used antitoxin in Vincent's angina. Occasionally a patient comes into the hospital with a diagnosis of diphtheria who has been getting antitoxin with no improvement. An examination of the inflammation has showed it to be Vincent's angina. From this I would infer that antitoxin has no value therein. We considered the cases of laryngeal diphtheria as severe cases from the standpoint of the stenosis, even if the cases were not toxic or late; however, an early serum injection in laryngeal cases produces just as favorable results as in the other types of the disease.

A LABORATORY METHOD FOR THE DIAGNOSIS OF SMALLPOX*

JOHN NIVISON FORCE, M.D., DR.P.H.
Assistant Professor of Epidemiology
AND
HELEN LOWELL BECKWITH, M.S., DR.P.H.
Assistant in Hygiene, University of California
BERKELEY, CALIF.

This paper presents the details of some experiments conducted with a view toward developing a method for the diagnosis of smallpox by means of a skin reaction produced by the intradermal injection of smallpox vesicle contents into previously vaccinated rabbits.

In several infectious diseases the invading organism acts as a cutaneous allergen and the application of this allergen to a skin previously sensitized gives rise to substances which cause an inflammatory reaction at the site of application.

Jenner[1] in his original series of experiments noted that cutaneous allergic phenomena were produced on the application of variolous material to the scarified skins of persons sensitized by previous smallpox or cowpox. Tieche[2] in 1912 showed that these reactions were not produced in persons immune to smallpox when varicella material was used, and suggested the use of these reactions in differential diagnosis. He further suggested that the material be heated to 70 C. for five minutes in order to avoid accidental infection with syphilis. "Nothing is needed," writes Tieche, "for judging this reaction except an eye trained in dermatology and a person who reacts with typical allergy. Since the physician can himself acquire this allergy through successive vaccinations (with vaccine virus) he can try the reactions on himself in doubtful cases." In a later communication Tieche[3] asserts that he has employed this method of differential diagnosis in 34 cases. The material from 14 of these produced allergic reactions on three previously vaccinated persons. The material from the remaining 20 cases did not give allergic reactions and these cases later proved to be either varicella or erythema multiforme.

In reviewing the work of Tieche it occurred to us that more consistent results could be obtained through the use of sensitized animals by trained observers at established laboratories than by experiments conducted by the family physician, perhaps unfamiliar with the phenomena of skin reactions, on human beings whose exact allergic condition might be largely

* Read before the Section on Pathology and Physiology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Jenner: An Inquiry into the Causes and Effects of Variolae Vaccinae, London, 1798.

2. Tieche: Ueber die Verwendbarkeit des vakzinalen Allergie (Frühreaktion von Pirquet) als diagnostiches Hilfsmittel bei Verdacht auf Variola, Cor.-Bl. f. schweiz. Aerzte, 1912, xlii, 626.

3. Tieche: Differentialdiagnose von Variola und Varizellen mit Hilfe der kutanen Allergie, Cor.-Bl. f. schweiz. Aerzte, Sept. 5, 1914, p. 1121.

a matter of conjecture. We accordingly determined to apply vaccine virus, smallpox vesicle contents, and varicella vesicle contents to the skins of previously vaccinated animals and observe the resulting cutaneous allergic phenomena.

In choosing the method for the application of the allergen to the sensitized skin we decided on intradermal injection.

Von Pirquet[4] has shown that this method is much more delicate than the direct application to the scarified skin, since a given quantity of allergen will produce a reaction intradermally after an equal quantity has failed to give the cutaneous reaction in the same subject. The intradermal test was applied by Moussu and Mantoux[5] in 1908, for determining tuberculosis allergy in cattle, by Van Es and Schalk[6] in experiments with avian tuberculosis, and recently by Gay and Claypole[7] as a method of producing the typhoin reaction in sensitized rabbits.

We employed the following technic in giving the intradermal injections: On the day preceding the test, two areas about 5 cm. in diameter were clipped and shaved on the back of a previously vaccinated rabbit. The injection was made with a glass tuberculin syringe provided with a 26 gage needle 10 mm. in length. The amount injected was between 0.05 and 0.1 c.c. and if properly placed was felt as a small lump in the skin. The intradermal reaction appears within twenty-four hours after the injection, but may not reach its maximum until the second day. It disappears gradually. It is characterized by an infiltration of the skin at the site of the injection, with redness and often heat. The redness fades before the infiltration disappears.

Fig. 1.—Intradermal reaction produced by injecting 0.1 c.c. of a 1 in 10 dilution of the contents of a smallpox vesicle in physiologic salt solution; Rabbit 9. Forty-eight hours after injection. The rabbit was vaccinated three and one-half months before the date of the test.

Experiment 1.—A. A series of five rabbits previously vaccinated with rabbit-grown vaccine virus was given intradermal injections of a 1 in 10 dilution of rabbit-grown vaccine virus in physiologic salt solution. Control injections were made in three of these rabbits with a 50 per cent. glycerin diluent used in the preparation of the vaccine virus. A normal rabbit received both injections. Positive reactions were obtained in each of the vaccinated rabbits, while the normal rabbit showed no reaction. The control injections of glycerin produced slight redness but no induration.

B. A series of guinea-pigs which had been previously vaccinated with calf-grown vaccine virus was inoculated with calf virus. In some cases the inoculations were in the form of skin scarifications and in others the intradermal method was employed. In every case cutaneous allergic phenomena were present whether the guinea-pigs had been originally vaccinated on the skin of the scrotum or by the subcutaneous injection of 1 c.c. of a 1 in 100 suspension of vaccine pulp in physiologic salt solution. A normal guinea-pig used as a control to the above intradermal injections, though showing no reaction, was sensitized to such a degree by the single intradermal injection that it presented allergic phenomena on later skin vaccination.

C. A series of calves which had been used for the production of vaccine virus was given intradermal injections in the skin fold at the root of the tail using a 1 in 10 dilution of calf-grown vaccine virus. Positive reactions occurred in each instance, while two control calves gave no allergic reactions during the first twenty-four hours, but at the end of the usual incubation period developed typical vaccinia vesicles at the site of inoculation.

This experiment shows that cutaneous allergy to vaccine virus is present in rabbits, guinea-pigs, and calves which have been sensitized by vaccine virus. The virus used for the vaccination of an animal need not necessarily be produced from an animal of the same species, and this rule applies also to the virus used for the intradermal test. The cutaneous allergy is present whether the original vaccination was on or under the skin.

Having studied the reactions produced in previously vaccinated animals by inoculations with vaccine virus, the next step was to compare these reactions with those obtained by inoculation with smallpox vesicle contents.

Experiment 2.—A. The inoculation was made with the contents of a small capillary tube which had been sent to the state hygienic laboratory with the statement that it had been filled from a smallpox pustule. Data as to the period of the disease or age of the material were not furnished. A previously vaccinated rabbit was given an intradermal injection of a 1 in 10 dilution of the contents of the capillary tube in physiologic salt solution. A normal rabbit was inoculated as a control. At the end of twenty-four hours, the site of the inoculation in the sensitized rabbit showed an indefinite red areola 20 mm. in diameter with slight induration. The control rabbit showed no redness or induration at the site of inoculation.

B. A series of five previously vaccinated rabbits was given intradermal injections with a 1 in 10 suspension in physiologic salt solution of material from the following case:

R. A. B., an employee in the department of grounds and buildings, was admitted to the university infirmary, July 27, 1914, with the following history: Patient had returned to Berkeley, July 6, from a visit to the family of a brother in Eureka, Humboldt County. The brother's children were just recovering from alleged chickenpox. At that time a mild epidemic of smallpox was present in Humboldt County. The patient began to feel ill on July 22, and on the next day developed a papular rash on his face. He continued at work driving a team on the university campus until the rash became pustular, when he reported to the infirmary. When examined

4. Von Pirquet: Ueber die verschiedenen Formen des allergeschen Reaction bei der Revaccination, Ztschr. f. Immunitätsforsch. u. Exper. Therap., Orig., Nos. 1 and 2, July 5, 1911, p. 1.
5. Moussu and Mantoux: Sur l'intro-dermo-réaction à la tuberculine chez les animaux, Proc. Sixth Internat. Cong. on Tuberculosis, iv, Part 2, p. 821.
6. Van Es and Schalk: Avian Tuberculosis, Bull. 108, North Dakota Agric. Exper. Sta.
7. Gay, F. P., and Claypole, Edith J.: An Experimental Study of Methods of Prophylactic Immunization against Typhoid Fever, Arch. Int., Med., November, 1914, p. 671.

the patient had a well-marked pustular eruption on the body, face, palms and soles. A clinical diagnosis of smallpox was made, the patient isolated, and his fellow workmen vaccinated. On July 28 the contents of several pustules were collected in capillary pipets and placed on ice. All of the rabbits inoculated with material from R. A. B. gave sharply positive reactions, though the test was not applied to three of the five until nine days after the material was collected.

Since the smallpox vesicle contents used in the preceding experiment preserved their properties as allergens for nine days at ice-box temperature, it would seem to be practicable to collect vesicle contents in capillary tubes at the bedside and ship in vacuum bottles or other suitable containers to central laboratories for intradermal tests on rabbits sensitized to vaccine virus.

Cutaneous allergic phenomena having been produced in previously vaccinated animals with both vaccine virus and smallpox vesicle contents, it became necessary to show a constant inability to produce the reaction with varicella vesicle contents in order to prove the value of the test in the differential diagnosis of smallpox from chickenpox.

Experiment 3.—A. Material for this experiment was collected from varicella cases occurring in the service of the university infirmary. In each instance the contents of varicella vesicles were collected in capillary pipets, diluted with physiologic salt solution to represent 1 part in 10 of the vesicle contents, and injected intradermally into the skin of a rabbit sensitized to vaccine virus. In no instance was a reaction produced by inoculation of varicella vesicle contents.

TABLE 1.—RESULTS OF THE INOCULATION BY INTRADERMAL INJECTION AND SKIN SCARIFICATION WITH VACCINE VIRUS, OF RABBITS, GUINEA-PIGS, AND CALVES PREVIOUSLY SENSITIZED WITH VACCINE VIRUS

Animal	Date of Vaccination	Date of Test	Manner of Test	Result
Rabbit 2	2/24/1914	3/ 9/1914	Intradermal	3/10: Reddened area 20 by 22 mm. Induration. Back shaved and vaccinated with no result
Rabbit 3	3/24/1914*	3/31/1914	Intradermal	4/ 1: Reddened area 10 by 12 mm. Control spot showed only slight redness
Rabbit 4	3/ 2/1914	3/17/1914	Intradermal	3/18: Reddened, indurated area
Rabbit 4	3/ 2/1914	3/20/1914	Intradermal	3/21: Deeply reddened, indurated area 25 by 25 mm. Control swollen slightly but not red or indurated
Rabbit 6	.....	3/19/1914†	Intradermal	3/20: Slightly swollen, not red or indurated
Rabbit 6	.....	3/20/1914†	Intradermal	3/21: Slight swelling. No redness or induration. Control, slight swelling, no redness or induration
Rabbit 9	4/ 3/1914	4/21/1914	Intradermal	4/22: Induration and redness
Guinea-pig A	2/19/1914*	3/5/1915	Vac. on scrotum	3/ 6: Redness and induration around scratches 3/ 8: No vesicles. Redness disappeared
Guinea-pig B, C, D, E	2/ 4/1915	2/11/1915	Intradermal	2/12: Diffuse redness and induration from 16 to 40 mm.
Guinea-pig B, C, D, E	2/ 4/1915	2/19/1915	Scrotum	2/20: Slight areola along line of vaccinated scratches 2/21: Decreasing
Guinea-pig 1	.....	2/19/1915†	Intradermal	2/20: Slight diffuse redness, no induration 2/21: Redness 6 by 7 mm. induration 2/24: Increasing in size 2/26: Decreasing
Guinea-pig 1	2/19/1915‡	3/17/1915	Vac. skin of vulva	3/18: Well-marked areola along line of vac. scratches 3/19: Decreasing. 3/20: Decreasing
Guinea-pig 2	.....	3/17/1915†	Vac. skin of vulva	3/18: Slight redness on vaccinated scratches 3/19: Beginning vesicles 3/20: Vesicle formation
Calf 171	12/18/1914	1/18/1915	Intradermal	1/19: Indurated red area 20 mm. in diameter
Calf 172‖	1/21/1915	1/21/1915	Intradermal	1/20: Redness and induration still present 1/22, 1/23, 1/24: No reaction. 1/26: Typical vaccinia vesicle coincident with general vaccinia eruption
Calf 172	1/21/1915	2/11/1915	Intradermal	2/12: Indurated spot 10 by 15 mm. 2/13: Decreasing
Calf 173	1/28/1915	2/11/1915	Intradermal	2/12: Indurated spot 12 by 12 mm. 2/13: Decreasing
Calf 174	2/11/1915	2/11/1915	Intradermal	2/12, 2/13: No reaction 2/16: Well developed vaccinia vesicle at site of inoculation coincident with general vaccinia eruption

* Subcutaneously.
† Normal.
‡ Intradermal.
‖ Normal; vaccinated for vaccine production.

TABLE 2.—RESULTS OF THE INOCULATION BY INTRADERMAL INJECTION WITH SMALLPOX VESICLE CONTENTS OF RABBITS PREVIOUSLY SENSITIZED WITH VACCINE VIRUS

Rabbit	Date of Vaccination	Date of Test	Result
3	3/24/1914	7/29/1914	7/30: Reddened areola, 25 mm. in diameter, hot and slightly indurated
9	4/ 3/1914	7/29/1914	7/30: Reddened area, no induration 7/31: Areola 15 mm. in diameter, marked induration Animal photographed (Fig 1).
2	2/24/1914	8/ 6/1914	8/ 7: Well-marked indurated area
4	3/ 2/1914	8/ 6/1914	8/ 7: Deeply reddened indurated area
7	3/25/1914	8/ 6/1914	8/ 7: Sharply positive reaction, red and indurated

TABLE 3.—RESULTS OF INOCULATION BY INTRADERMAL INJECTION WITH VARICELLA VESICLE CONTENTS OF RABBITS PREVIOUSLY SENSITIZED WITH VACCINE VIRUS

Rabbit	Date of Vaccination	Date of Test	Result
2	2/24/1914	12/ 3/1914	No induration or redness
3	3/24/1914	12/ 3/1914	No induration or redness
4	3/ 2/1914	4/11/1914	No induration or redness
4	3/ 2/1914	12/ 3/1914	No induration or redness
9	4/ 3/1914	12/ 2/1914	No induration or redness
11	Normal	12/ 3/1914	No induration or redness at any time for the week succeeding test

B. A series of rabbits was injected intradermally with material obtained in the following case which presented certain "border-line" characteristics:

A. M. H., a student, was admitted to the university infirmary, Jan. 15, 1915, with the following history: During the Christmas vacation he had occupied a bed with his brother at his home in San Diego. Dec. 30, 1914, the brother

developed a rash strongly suggestive of smallpox. The brother was isolated and A. M. H. was vaccinated and the health officer finally decided that the brother had chickenpox and A. M. H. was allowed to return to the university. On Jan. 14, 1915, A. M. H. noticed vesicles on his body. January 16, patient showed scattered vesicles over his body characteristic in distribution and general appearance of chickenpox. January 17, the eruption had become more general and several of the lesions had become umbilicated. January 18, edema of the face; a profuse eruption appeared on the face, body and arms, with many umbilicated pustules and papules on palms and soles. January 19, maximum temperature 39.4 C. (102.9 F.). January 21, pustule contents were collected and a series of vaccine sensitized rabbits was inoculated intradermally. January 22, the patient was photographed (Fig. 2). No reaction occurred in any of the series of rabbits.

Had the student whose case is here described been first seen at the height of the eruption, and had he not been vaccinated successfully a few years previously he would have offered a splendid exercise in clinical differential diagnosis. It is in this class of "border-line" cases that we hope the skin reactions of sensitized rabbits and guinea-pigs will prove a diagnostic aid.

It appears that cutaneous allergic phenomena are produced, in animals previously sensitized with vaccine virus, by the intradermal injection of vaccine virus and smallpox vesicle contents. On the other hand, such phenomena are not produced by the intradermal injection of varicella vesicle contents. There is a possible objection to the last statement, since the cutaneous allergy in the preceding series of rabbits might have expired before they were tested with varicella vesicle contents.

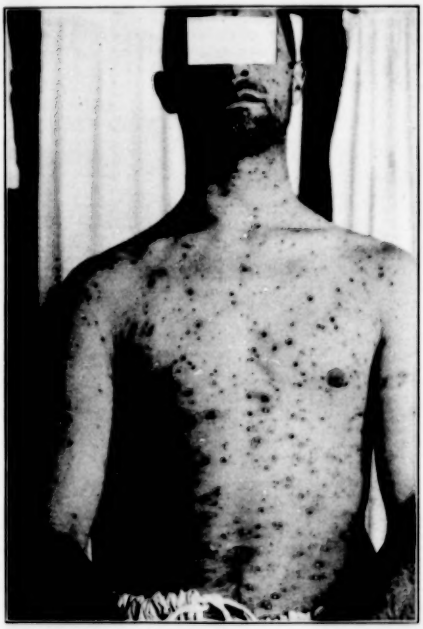


Fig. 2.—Chickenpox. Eighteenth day after appearance of eruption. Umbilicated pustules. History of exposure to varicella which in its early stages was so suggestive of smallpox that patient was quarantined and all contacts vaccinated.

Experiment 4.—The preceding series of rabbits was given intradermal injections of commercial glycerinated vaccine virus not diluted with physiologic salt solution. The test was made one week after the last injection with varicella material described in Experiment 3, *A*. Positive reactions occurred in every instance. The test was repeated in fourteen weeks and positive reactions were seen in several of the rabbits. Since all but one of these animals had been originally vaccinated with rabbit-grown virus it follows that the reactions to calf virus were not reactions to calf protein.

This experiment shows that the failure of the rabbits to react to varicella material was not due to an absence of cutaneous allergy, since several of these rabbits retained cutaneous allergy to vaccine virus for one year after the original vaccination.

SENSITIZATION OF RABBITS

The strain of vaccine virus used in the original vaccination of the series of rabbits used in the foregoing experiments was derived from vaccine pulp collected from a calf and ground in five volumes of glycerin. It differed in no way from ordinary commercial glycerinated vaccine virus. The strain had been grown only on calves and was derived originally from smallpox cases. The technic of vaccination was the following:

A gray rabbit was placed on an animal board, the hair of the back clipped and the skin shaved over an area approximating 15 by 20 cm. The skin was washed with sterile water in order to free it from soap, and was dried with sterile cotton. A suspension of the seed virus was made by adding enough physiologic salt solution to produce a dilution of 1 in 50 of the original vaccine pulp. One c.c. of this suspension was rubbed into the freshly shaved back of the rabbit, using the edge of a scalpel. At the end of five days the vaccinated area was washed, dried, and the pulp removed with a sharp curet. The pulp was immediately ground by hand in an agate mortar with seven volumes of a mixture consisting of 50 per cent. glycerin, 49.5 per cent. of sterile water and 0.5 per cent. phenol. After grinding the glycerinated pulp it was stored in the ice box without straining through bolting cloth. In each case this 1 in 8 seed virus was diluted to represent 1 in 50 of the original pulp before being used to vaccinate the next rabbit of the series.

By carrying the original calf-seed virus through four generations of rabbits we obtained a strain of virus which would grow readily on the backs of rabbits. It seemed obvious, however, that the technic of immunization might be much simplified if the virus could be administered subcutaneously and yet result in the sensitization of the animal. In an attempt to thus simplify the technic of immunization a normal rabbit was vaccinated subcutaneously at a previously shaved site with 0.5 c.c. of a dilution in physiologic salt solution representing 1 in 100 of vaccine pulp from another rabbit. This dose was repeated at intervals of three days until five doses had been given. On the day following the last dose a slight infiltration appeared at the site of the last injection. A normal guinea-pig was also vaccinated subcutaneously at a previously shaved site with 1 c.c. of a dilution in physiologic salt solution of commercial glycerinated vaccine virus representing 1 in 100 of the original pulp. No reaction was observed at the site of vaccination during the subsequent week.

Subsequent tests of these two animals (Table 1) showed that they had been sensitized by the subcutaneous vaccination.

The efficiency of subcutaneous vaccination has been well tested. As far back as 1865, Chauveau[8] vaccinated six children by subcutaneous injection of 0.02 to 0.04 gm. of vaccine lymph. Three of these children were revaccinated in the usual way with positive results while two gave negative results on revaccination twice repeated. Calmette and Guerin[9] vaccinated rabbits subcutaneously in 1901, while Kraus and Volk[10] produced immunity in monkeys by subcutaneous injections of vaccine virus diluted 1 in 500 with physiologic salt solution. Knöpfelmacher[11] produced immunity in children by the subcutaneous injection of 1 c.c. of a bacteria-free suspension of one part of glycerinated (1 in 4) vaccine virus in 200 parts of physiologic salt solution. He noted between the eighth and twelfth day following the vaccination the sudden appearance at the site of inoculation of a pea to plum-sized infiltration surrounded by an areola of redness. The areola faded in a few days but the infiltration often persisted for a week. In a later series of experiments Knöpfelmacher[12] immunized twenty children by the subcutaneous injection of 0.5 to 1 gm. of vaccine lymph heated to 58 C for one-half hour. These children gave negative results to skin vaccination performed nine days after the subcutaneous vaccination, but showed cutaneous allergic phenomena.

TABLE 4.—RESULTS OF INOCULATION BY INTRADERMAL INJECTION WITH COMMERCIAL VACCINE VIRUS OF RABBITS PREVIOUSLY SENSITIZED WITH RABBIT-GROWN VACCINE VIRUS

Rabbit	Date of Vaccination	Date of Test	Result
2	2/24/1914	12/10/1914	12/11: Areola of 10 mm., slight induration 12/12: Areola of 12 mm. marked induration 12/14: Indurated area 11 mm., no redness
		3/29/1915	3/30: Areola of 10 mm., slight induration 3/31: Areola 12 by 20 mm., slight induration 4/ 2: Areola 10 by 20 mm., slight induration 4/ 3: Decreasing
3	3/23/1914*	12/10/1914	12/11: Diffuse redness 33 mm. in diameter, heat and slight induration. 12/12: Areola 12 mm., marked redness, marked induration 12/14: Induration 7 mm. in diameter, areola 15 mm.
4	3/ 2/1914	12/10/1914	12/11: Diffuse redness 13 mm. in diameter, slight induration 12/12: Areola of 12 mm., marked induration 12/14: Areola of 11 mm., marked induration
		3/29/1915	3/30: No reaction. 3/31: No reaction 4/ 2: No reaction. 4/3: No reaction
7	3/25/1914	12/10/1914	12/11: Diffuse redness of 9 mm., no induration 12/12: Areola of 11 mm., no induration 12/14: Areola of 14 mm., slight induration
		3/29/1915	3/30: No reaction. 3/31: No reaction 4/ 2: No reaction, hair is growing rapidly and covering shaved area 4/ 3: No reaction, hair has covered area 4/ 5: Area shaved, revealing areola of 10 mm. deeply reddened, markedly indurated
8	3/25/1914	12/10/1914	12/11: Areola 11 mm., marked induration 12/12: Areola 15 mm., marked induration 12/14: Areola 14.5 mm., induration
		3/29/1915	3/30: Areola 12 mm., slight induration 3/31: Areola 20 by 15 mm., marked induration 4/ 2: Areola 15 by 15 mm., marked induration 4/ 3: Decreasing
9	4/ 3/1914	12/10/1914	12/11: Areola 12.5 mm., slight induration 12/12: Areola 12.5 mm., marked induration 12/14: Areola 12 mm., marked induration
11	†	12/10/1914	12/11: No redness, 2 mm., induration. 12/12: Same 12/14: No change
12	†	3/29/1915	3/31: Diffuse redness, no induration 4/ 2: Redness faded, no reaction

* Subcutaneously. † Normal.

LABORATORY METHODS FOR THE DIAGNOSIS OF SMALLPOX

The cell inclusions first described by Guarnieri[13] in 1892, which are found in the proliferating epithelial cells of the vaccinated cornea of the rabbit, are now considered to be evidences of tissue reaction in the presence of small "elementary bodies" which belong to the group of filterable viruses. Cell inclusions are characteristic of the group of dermotropic diseases to which variola, vaccinia, and varicella belong. In fact Swellengrebel[14] has shown that the cell inclusions of varicella are very similar to those produced by corneal inoculation with vaccine virus. The only differences noted were that the varicella inclusion bodies appeared more feebly stained, showed a structure more like the cell nucleus in character, and were more often found within the cell nucleus than the vaccinia inclusion bodies.

Paul[15] scarifies the rabbit's cornea with the edge of a cover glass which has been dipped in the smallpox vesicle contents. At the end of thirty-six hours tiny "air blisters" can be seen with a hand lens. After forty-eight hours these vesicles are visible to the naked

8. Chauveau: Bull. de l'Acad. de méd., 1865, xxxi, 1111.
9. Calmette and Guerin: Recherches sur la vaccine experimentale, Ann. de l'Institut Pasteur, 1901, xv, 161.
10. Kraus and Volk: Weitere Studien über Immunität bei Syphilis und bei der Vaccination gegen Variola, Wien. klin. Wchnschr., 1906, xix, 620.
11. Knöpfelmacher: Subkutane Injectionen von Kuhpockenlymphe, Ztschr. f. Exper. Path., 1907, iv, No. 3, p. 880.
12. Knöpfelmacher: Aktive Immunisierung des Menschen mittelsabgetöteter Pockenvakzine, Med. Klin., 1910, vi, 619.
13. Guarnieri: Ricerche sulla patogenesi ed eziologia dell'infezione vaccinica e variolosa, Arch. per le sc. med., 1892.
14. Swellengrebel: Ueber Zelleinschlusse die bei der Hornhautimpfung mit Varizellen auftreten, Arch. f. Hyg., 1911, lxxiv, 164.
15. Paul: Zur Differentialdiagnose der Variola und der Varicellen. Die erscheinungen an der variolierten Hornhaut des Kaninchens und ihre fruehzeitige Erkennung, Centralbl. f. Bakteriol., Orig., March 13, 1915, p. 518.

eye though their contents have not as yet become turbid. In three or four days epithelial necrosis occurs at these spots with corneal ulcers. In order to differentiate the forty-eight-hour lesions of smallpox from those of accidental deep scarification, Paul immerses the enucleated eyeball in a mixture of mercuric chlorid and absolute alcohol. On inspection with the lens the focal necrotic spots immediately appear as white circular punctures "comparable to the development of a photographic plate." Inoculation with varicella material fails to produce these spots. Paul considers this method of great diagnostic value in "the so-called border-line cases of smallpox" and certainly it is much simpler than comparison of the inclusion bodies. However, Paul admits that in vivo the lesions are so small and transparent that they can easily be overlooked. In order to confirm the diagnosis even as late as the forty-eighth hour after inoculation of the cornea, it is necessary to enucleate the eye of the rabbit, being extremely careful not to smear the eyeball with blood.

Since the diagnosis by means of the inoculation of rabbit's cornea requires time, skilled technic, and its final interpretation is doubtful, it follows that it is not suitable as a routine laboratory procedure. Another method consists in rubbing the suspected material on the freshly shaved back of a rabbit, but this requires a greater quantity of material than is ordinarily obtainable from the doubtful case with a few poorly developed pustules.

The method of Tieche requires only an individual sensitized to smallpox. In his experiments Tieche made use of three persons so sensitized, none of whom gave a reaction to varicella material. He does not state if these persons had ever had chickenpox. If so would there not have been a chance that they might have been sensitized to a possible varicella antigen contained in the varicella vesicle? This objection is rendered more valid since Kling[16] has succeeded in producing typical varicella vesicles in fifty-eight children by arm-to-arm inoculation of the varicella vesicle contents. The vesicles did not appear until the eighth day even in children recently vaccinated with vaccine virus. Tieche asserts that this reaction could not be confused with the allergic reaction produced by variola material; but suppose these recently varicellated children had been given intradermal tests with varicella vesicle contents, would we not have been justified in expecting cutaneous allergic phenomena?

By the use of animals sensitized to vaccine virus we eliminate a possible error due to the use of human subjects who may have had varicella, while the observations on cutaneous allergy are much simpler and can be made at least a day earlier than those on the inclusion bodies or even the "air blisters" described by Paul.

16. Kling: Schutzimpfung gegen Varizellen, Berl. klin. Wchnschr., Nov. 10, 1913, p. 2073.

TABLE 5.—RESULTS OF VACCINATING THE BACKS OF RABBITS WITH A STRAIN DERIVED FROM CALF SEED VACCINE VIRUS

Rabbit	Date of Vaccination	Source of Seed Virus	Date of Collection	Result
2	2/24/1914	Calf	3/ 1/1914	A few scattered vesicles
4	3/ 2/1914	Rabbit 2	3/ 8/1914	3/ 6: Erythema of shaved area 3/ 7: Beginning vesicles 3/ 8: Typical vesicle formation. Pulp collected from part of vaccinated area 3/12: Typical crusts on remaining pustules
5	3/10/1914	Rabbit 4	3/15/1914	3/13: Papules 3/14: Beginning vesicles 3/15: Typical vesicles. Pulp collected
7	3/25/1914	Rabbit 4	3/30/1914	Fair vesicle formation. Mixed with pulp from Rabbit 8
8	3/25/1914	Rabbit 5	3/30/1914	Good vesicles. Mixed with pulp from Rabbit 7
9	4/ 2/1914	Rabbit 7 Rabbit 8	.....	Good vesicles. Allowed to run full course of vaccinia without collection

CONCLUSIONS

1. Rabbits sensitized by vaccination with vaccine virus will give a marked intradermal reaction with smallpox vesicle contents in from twenty-four to forty-eight hours, but will not give such a reaction with varicella vesicle contents.

2. The cutaneous allergy following the original vaccination was present for at least eight months though there had been no stimulation by the allergen during that period (Rabbit 8).

3. The intradermal reaction was produced with smallpox material nine days after removal from the patient.

4. A laboratory diagnosis of smallpox is, therefore, available to physicians and health officers, since vesicle contents may be shipped in capillary tubes to central laboratories and there used for making intradermal tests on sensitized rabbits or guinea-pigs.

2631 Derby Street—2757 Telegraph Avenue.

ABSTRACT OF DISCUSSION

DR. ALLEN F. GILLIHAN, Oakland, Calif.: I hardly think the mass of the profession realizes the importance of the diagnosis of smallpox. The average physician reports any old thing to the health office and calls it smallpox. Sometimes there is a rash that is hard to distinguish from true variola. Heretofore health departments have had no satisfactory laboratory method of diagnosis; the inclusion bodies and corneal inoculation are not of practical value in health office laboratory work. If Dr. Force's method stands the test of time, I think it will prove very valuable, because it will settle the diagnosis of a great many cases of mild types of true variola. Under ordinary circumstances we could follow the case clinically and watch its development, but for epidemiologic reasons it behooves us to know as soon as possible whether it is smallpox or something else. The only criticism that I have to offer of Dr. Force's paper is that in the papular stage one can get practically no vesicle contents, because there is no vesicle as yet, and it is thus impossible to get material with which to make a diagnosis. Of course,

in three or four days the patient will develop vesicles, and in due time pustules; then there will be material to work with, but by that time usually your diagnosis is already made.

Dr. L. B. Wilson, Rochester, Minn.: It occurs to me that by using laboratory animals rather than immune persons for testing supposed smallpox virus, we would avoid the possibility of infection with streptococci, which are not infrequently present in symbiosis in cases of severe smallpox.

Dr. John Nivison Force: Ability to produce a skin reaction is not a test of the viability of either vaccine virus or smallpox vesicle contents. Dead material will give the reaction. I suggested shipping in a vacuum bottle in order to prevent decomposition. With regard to Gillihan's remark that variolation is forbidden by the state law, I will reply that Tieche suggests that the material be heated to avoid possible infection. My criticism of Tieche's method is based on the theoretical assumption that there is a varicella antigen in the varicella vesicle, since Kling has produced vesicles by arm-to-arm varicellation. If Tieche's subjects had once had varicella it is possible that they would give skin reactions to varicella material, just as they would give reactions to smallpox material if they had been recently vaccinated. By the use of animals you remove this doubt.

With regard to the criticism that by the time the case has advanced to the vesicular and pustular stages you will have no more difficulty with the diagnosis, I was not considering so much the difficulties of making a clinical diagnosis as the situation that may confront every health officer when he has to decide against other physicians in the community. If he appeals to the State Board of Health and they send an epidemiologist, some one some day may be even brave enough to question the state officer. We need, I think, something for the protection of the health officer, or vice versa, for the protection of the public; some laboratory diagnosis by which we can definitely say: "Here is a report on the material submitted by you. It gives a reaction characteristic of smallpox vesicle contents." Also we do not want a reaction that is too technically difficult for the average laboratory worker. It is the public health significance of the question which appeals to me more than the clinical aspects.

Helen Beckwith, Berkeley, Calif.: There is one point that Dr. Force did not bring out, and that is that nearly every physician is capable of collecting the material from the suspected case of variola or varicella, which is a decided advantage over the corneal test sometimes suggested. In the latter the material has to be collected and sent in a very careful way in order to carry out the test. In the skin test the material may be quite old, if kept cold, or may even be heated and still give a positive reaction.

Japanese Imperial Institute for the Study of Infectious Diseases

The Imperial Japanese Commission to the Panama Exposition is distributing a pamphlet describing the plant and the work of the Imperial Institute for the Study of Infectious Diseases located at Tokyo. The institute was founded in 1892 for the purpose of promoting the bacteriologic investigations begun by Kitasato. Its scope has been much extended since that time, when it was a private institution. It has been taken over by the government and much enlarged and its work made to include the study not only of the parasitology of the islands but of the bacteriology of the infectious diseases and the production and distributions of serums and vaccines for their prevention and cure. Teaching is also conducted in the institute, two courses of three months being conducted each year, with the view chiefly to the training of men for scientific health administration work. The graduates of these courses now occupy positions of responsibility in health work throughout the empire. The buildings and equipment of the institute are extensive and complete, and in the pamphlet their description is accompanied by numerous illustrations. A bibliography of over 400 publications of the institute is appended.

FOCAL DISEASE OF THE BRAIN

A CLINICAL REPORT OF EIGHT CASES *

CHARLES R. BALL, M.D.
ST. PAUL

The medical profession in general is inclined to be pessimistic with reference to operations for the removal of brain tumors. If the operation for the removal of a suspected brain tumor is proposed, the surgeon rather delights in quoting to you, with a shrug of his shoulders, that statistics show that recovery takes place in only from 3 to 5 per cent. of all cases. In answer to this general view, Cushing says:

> It depends on what is meant by recovery. If we put a strict construction on the word recovery, the statistics of the surgeon are probably correct, but if we can be satisfied with the alleviation of suffering, the preservation of vision and the prolongation of life in relative comfort and usefulness, often for many years, certainly 50 or 60 per cent. of all patients can be thus helped.

We are so intent on the localization and removal of the growth in its entirety in order to obtain a recovery in its strictest sense that we often miss the opportunity offered for relief in the 50 or 60 per cent. of the cases. Some of us no doubt are able to recall several humiliating occasions when we thought we had surely localized a brain tumor, but, after the surgeon had exposed the area where we fully expected to see it tower above the surrounding brain tissue, nothing but normal brain in all directions was found. The tumor, the chief object of the operation, from our point of view, was not found, and in our disappointment we forgot all about the relief of symptoms which, from the patient's point of view, was the real reason why he submitted to the operation. If we cannot find the tumor, let us try at any rate to do everything possible to afford our patient relief.

Case 1 is a good illustration of what may be done toward this end although no tumor was found.

Case 1.—Mr. G. S., aged 50, was seen in consultation in October, 1913. His symptoms were those of a slowly developing right-sided hemiplegia, the paralysis beginning in his foot and within a period of six months involving the entire right side. In addition to the paralysis, he had very severe attacks of epilepsy about once a week. These attacks were increasing in frequency. He had great fear of these attacks, and for several days after an attack he was quite confused mentally. There was nothing of a jacksonian character about the attacks. He was greatly depressed and cried easily. Six years before the beginning of his trouble he had fallen downstairs and injured his head quite badly.

Examination.—The serum Wassermann and spinal fluid examinations were negative. He had previously taken specific treatment to which he did not respond. The deep reflexes on the right side were more active than those on the left. There was also a Babinski. There were no sensory changes. The eye backgrounds were normal.

The diagnosis of brain tumor, involving the left motor area, was made and an operation advised with the understanding that it was not probable the tumor would be found, but that the outlook for relieving the epilepsy was good. The patient consented to the operation because of his great desire to be relieved from his attacks of epilepsy.

Operation.—The left motor cortex was located according to the method of Krönlein; a large bone flap was made over this area and the brain exposed. The appearance of dura and cortex was fairly normal. By palpation of the brain

* Read before the Section on Nervous and Mental Diseases at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

with the finger no evidence of any tumor lying beneath the cortex was discovered. With the firm conviction, however, that somewhere in the left motor area there must be a lesion which by reflex irritation through the left motor cortex caused the epileptic seizures, it was decided to clip out the cortex according to the method of Feodor Krause. The cortex was accurately located by means of faradic stimulation, and the entire area thus determined was removed to the depth of about one-fourth inch.

Postoperative History.—The entire right side was completely paralyzed for about two weeks after the operation. Then gradually the strength in it began to return. The epileptic attacks disappeared entirely. A recent inquiry in regard to this patient brought the information that he was in excellent health and spirits and was able to take care of his business. Some paralysis still existed on the right side, but he had better use of his leg and quite as good use of his arm and hand as he had prior to the operation.

The removal of the motor cortex in this case saved the operation from being a complete failure. With no visible tumor to remove, we endeavored to do the next best thing and relieve our patient of his most distressing symptom.

CASE 2.—Mr. G. S., aged 40, was seen in consultation Oct. 7, 1914; family history negative; personal history unimportant. Patient was perfectly well until in January, 1914, when he began to suffer with headache. The headache was more or less constant and had gradually become worse; when I first saw him it was so severe at times that full doses of morphin hypodermically failed to relieve him. During these severe headaches he became delirious. He occasionally had attacks of vomiting, projectile in character.

Examination.—The serum Wassermann and spinal fluid examinations were negative. The intraspinal pressure was greatly increased; temperature was normal; white blood count, 14,300; slight trace of albumin in urine; physical condition fairly good; hemoglobin, 79 per cent. There was considerable pain in back of head extending down the neck; any jarring, as riding in train or shaking the bed, increased discomfort in head. A good deal of rigidity in the muscles of the neck was present. Percussion in the occipital region seemed to cause more pain than elsewhere on the cranium; changing position from lying down to sitting up or moving the head, caused dizziness. There was no nystagmus or paralysis of eye muscles. There were double choked disks on both sides with retinal hemorrhages. Hearing in both ears was good. The two sides of the face seemed equally well enervated. Deep and superficial reflexes were present on both sides. There was no Babinski. There were no sensory disturbances. When lying down patient appeared to have good control of both upper and lower extremities. When he walked, he threw feet forward and body and head backward, so that he had to be well supported to keep him from falling backward. Vigorous specific treatment gave him no relief.

As there were no definite localizing symptoms and the headache was becoming unbearable, a decompression operation was advised. Taking into consideration the occipital pain, rigidity of neck muscles, high degree of choked disks, vertigo on change of position and the position assumed by the patient when he attempted to walk, the good mental condition of the patient, except when he was suffering severely, and the absence of any paralysis, it was thought wiser to make the decompression in the occipital region.

Operation.—Suboccipital decompression was performed on October 17, exposing fully both lobes of the cerebellum and the medulla; the dura was very tense and when it was opened serous fluid oozed out. The cerebellum presented a normal appearance; the cerebellar-pontine angle on both sides was exposed and a trocar was put into the cerebellar lobes in different directions, but nothing was found. The dura was left open and the wound was closed.

Postoperative History.—The patient made a fairly uneventful recovery from the operation. His relief from severe headache was immediate. In two weeks his choked disks had entirely disappeared. Up to the present time he appears to be in the best of health and says he never felt better in his life.

The case may be regarded as an unusually successful result from decompression. It also illustrates a point which I wish to emphasize. Owing to the complexity of brain function frequently we are unable to localize a brain growth accurately. If, however, we study all the symptoms with reference to whether the growth is situated anterior or posterior to the tentorium, we shall be less apt to err in our decompressive measures than if we attempt a more definite localization. We are sometimes misled in cases in which the general symptoms all point to a posttentorial growth but because of some few paralytic symptoms direct our efforts to the motor area.

Fig. 1.—Greatly enlarged sella in Case 2.

CASE 3.—Miss M. S., aged 29, single, schoolteacher, was seen in consultation Dec. 5, 1914. Family and personal history, unimportant. The present trouble began seven years ago with a slight buzzing and gradually increasing deafness in right ear. The past two months she had attacks of vomiting of the projectile type. She has been able to teach regularly, however, until within three or four days of the date of the consultation. She now complains of headache, which has been present for some time. This is particularly severe in the back part of her head and down her neck. The pain is increased on coughing or sneezing as well as by any other jarring, such as riding on the train. There is a feeling of stiffness in the muscles of the neck.

Examination.—General state of nutrition, good; heart and lungs, apparently normal. Station is poor, with tendency to fall toward the right; in walking her gait is unsteady and she tends to fall, also, toward the right. Pupils symmetrical, equal in size and reacted to both light and accommodation; horizontal nystagmus, areflexia present in right eye, left eye normal. There was diminished sensation on the right side of face and right side of tongue. There was a slight involvement of the seventh nerve on the right side. Hearing in right ear greatly diminished; left ear, normal. Bone conduction in right ear not increased. No other involvement of the cranial nerves was observed. The deep reflexes were normal. There was no Babinski. Loss of muscle sense in right arm and leg was marked. There was an awkwardness and slowness in the movements of the right arm and hand (adiado-

kocinesis) apparent in supination and pronation and movements of the fingers. Percussion over the head did not reveal any particular area of sensitiveness; mental condition, good; serum Wassermann, negative; urine, negative; choked disks on both sides, with only slight impairment of vision.

The diagnosis was slow growing tumor of the right cerebellar-pontine angle. Operation was advised and accepted.

Operation.—A tumor about the size of an English walnut was found in the right lateral recess and as much of it as possible removed. It was found to be sarcomatous in character.

Postoperative History.—The recovery of the patient after operation was uneventful. A recent communication from her physician says: "Two days ago she came alone to my office and walked up a long flight of stairs. She walks as yet in an unsteady manner and does not dare to trust herself away from home in any walks of more than three or four blocks. There is still some difficulty in the use of the right hand but this is better than before the operation. The headache and choked disks have entirely disappeared and the vision is normal in both eyes. There is just a suggestion of the nystagmus; sensation on the right side of the face is normal but still diminished in the tongue. In general her condition has steadily improved since the operation, although the improvement in the past two or three months has been very slight. She is planning to take up her school work in September."

This patient is another example of a partial recovery, since the nature of the growth and the fact that it was not entirely removed makes the outlook for its return extremely probable. It cannot be classified in the statistics of absolute recovery (from 3 to 5 per cent.), but may justly be regarded as a successful brain operation, since relief from all distressing symptoms up to the present time was obtained. The case is interesting because of the length of time intervening between the appearance of the first symptoms and the development of symptoms severe enough to cause the patient to seek medical aid; also for the reason that she was able to continue her regular work as schoolteacher for so long a time with such a large growth in this location.

Fig. 2.—Slightly enlarged sella in Case 8; posterior clinoid indistinct.

Case 4.—Mrs. M. W., German, housewife, married, aged 52, was seen in consultation March 4, 1913. Family history and personal history, up to beginning of present trouble, unimportant. Present trouble began about one year previous to date of consultation with a severe attack of epilepsy in which the patient fell to the ground and was unconscious for several hours. She has had two attacks of this nature about a month apart. In addition to these attacks she has seizures coming three or four times weekly which are distinctly jacksonian in character. The attack always starts in the left thumb with a cramping and painful sensation; this rapidly extends to the forearm, then arm and face and sometimes to the other side of the body. During the attack the pain in the muscles of the arm is intense. Usually consciousness is retained but occasionally it is lost for a few seconds. The entire attacks last three or four minutes. Her memory is poor, particularly for recent events; she becomes dizzy when she gets up quickly or bends forward; stooping down will often bring on an attack.

Examination.—The physical condition of the patient is good. She eats and sleeps well. She is quite free from headache, and percussion over the cranium does not reveal any sensitive areas. The pupils are symmetrical in shape, but the left is larger than the right; both react to light and accommodation. The eye backgrounds are normal. Movement of bulbi free. There is no nystagmus. Hearing and vision good. No paralysis of facial nerve. Deep and skin reflexes present. No Romberg. The sensation, for both touch and pain, is much diminished in left hand. Astereognosis in left hand. She is quite clumsy with her left hand. The strength in it is also lessened. Serum Wassermann negative. No spinal fluid examination was made.

The diagnosis was brain tumor situated in left posterior central convolution.

Operation. — This patient was operated on April 1, 1913. A large flat tumor covering and firmly adherent to the brain cortex, lying mostly posterior to the fissure of Rolando was found. This tumor had perforated the dura in many places and had eaten into the skull. Because of its great tendency to bleed, its firm adherence to the brain tissue beneath it and its evident malignant nature, no attempt was made to remove it. Microscopic examination of small portions of it removed at the operation indicated that it was of a sarcomatous nature.

Postoperative History. — The patient lived almost two years after her operation without much change in her condition.

In this case it is interesting to note that the symptoms correspond with our ideas of brain localization; also, notwithstanding the presence of a large tumor which had in many places destroyed the dura and bone tissue about it, there was almost complete absence of pain and no sensitive areas were discovered by percussion.

Case 5.—Mr. N. C., Swede, aged 60, was seen in consultation Sept. 15, 1914. Family and personal history not important. The patient says he has always been in excellent health. He cannot remember ever having had a severe illness. No history of influenza or ear disease. He was feeling perfectly well and working on his farm, as usual, when one day, six weeks before his visit to me, he was suddenly seized with a severe epileptic convulsion and fell unconscious to the ground. He remained in an unconscious condition for several hours. He apparently made a good recovery from this attack, but in three or four days he had another of the same nature, and after this attack he noticed an awkwardness and clumsiness in the use of his left arm and leg. This condition of the left side had steadily become worse so that at the time of examination paralysis of the left leg was almost complete. The patient also had typical attacks of jacksonian epilepsy, starting in the left toe and extending over the entire left side.

The slightest irritation of the skin over the left side would bring on one of these attacks. Occasionally he lost consciousness in these attacks but usually not. He complained of considerable headache, mostly over the back part of his head.

Examination.—Physically, nothing significant was observed except a marked degree of pyorrhea. Temperature was constantly normal. Pupils were equal and reacted to both light and accommodation. There was no nystagmus, no cranial nerve paralysis. The eye backgrounds were normal. The deep reflexes in the left side were more active than in the right. Ankle clonus and the Babinski were present in the left side. The muscle sense on the left side was greatly disturbed. The patient when asked to close his eyes and touch his nose with the tip of his index finger seemed unable to locate his face. He was unable to recognize any object put in his left hand by the sense of touch. His mind remained clear until within a few days before his operation, when he became mildly delirious at times. The entire cranium was sensitive to percussion but apparently no one place more than another. Urine negative and serum Wassermann negative.

Operation.—The patient was operated on Oct. 3, 1914. The brain over the left motor area was exposed. In breaking back the bone flap the dura was torn and on inspection a little pus was noticed oozing out through the opening; tracing the pus back to its origin, a large completely encysted abscess was found situated about one-fourth inch below the dura, situated at the upper part of the Rolando fissure and posterior to it. The abscess contained about 2 ounces of white thick pus.

Postoperative History.—The patient recovered from the immediate shock of the operation but died on October 7, four days afterward, of septic meningitis.

The interesting feature in this case was the unexplainable cause of the abscess, unless the pyorrhea might be so regarded and the evidently long duration of it without causing any symptoms.

CASE 6.—Male, German, aged 48, was seen in consultation Oct. 5, 1914. Family and personal history unimportant except that patient was kicked on the head over the left parietal region when 11 years old, by a horse. He was not rendered unconscious by the injury nor was he attended by a physician. He remembers that his mother dressed the wound and it discharged pus for some time. The scar is still plainly visible. In August, 1914, he tripped and fell on a hard cement floor, striking his shoulder and face and jarring his whole body. A few days after this fall he felt some pain in his big toe on the right side. He soon began to notice that he could not handle the right leg and foot as well as formerly. This condition increased and gradually involved his arm. At the time I first saw him he could not walk without help and then with the characteristic swing and drag of the right limb, typical of a hemiplegic condition. He complained of headache chiefly in the occipital region.

Examination.—His mentality was good. He had no vomiting spells. His vision was also good. Nothing significant was found in the physical examination; temperature normal; serum Wassermann, negative; spinal pressure, much increased. Globulin reaction ++. Lymphocytes 5/3. Spinal fluid Wassermann, negative. Pupils were equal and reacted to both light and accommodation. No nystagmus. Field of vision, normal. Eye backgrounds, normal. No evidence of cranial nerve involvement. No Kernig. Both deep and superficial reflexes present. No ankle clonus or Babinski; slight Romberg; no sensory disturbance; marked weakness of right arm and leg.

Patient was able to be up and walk around with help and on several occasions went out for an automobile ride; each time after returning he seemed more helpless. On October 10 he began to vomit and became stupid and confused mentally. The paralysis in arm and leg was now absolute.

Operation.—Oct. 13, 1914, he was operated on. A large bone flap was made over the motor cortex on the left side. When the dura was opened no pulsation could be felt, and an area of boggy consistency was revealed. When a trocar was put into this area a clear yellowish fluid flowed out and on enlarging the opening numerous fresh blood clots were found. This cyst was situated between the dura and brain and was flattening the brain convolutions down into the cranial cavity. The walls of the cyst were as thick as the dura itself. The cavity of the cyst was packed with gauze and the wound closed.

Postoperative History.—The next day after the operation the patient began to use his paralyzed arm and leg apparently without difficulty. He was delirious for several days and had several convulsive attacks; otherwise his recovery was uneventful. At the present time he appears perfectly well and works every day.

Fig. 3.—Patient 8, showing tendency toward obesity and feminization of type.

This case is interesting in that it shows the remote effects of old head injuries. The cyst was undoubtedly caused by the injury which the patient had received when a boy. It was probably beginning to degenerate when he had his fall in August. This fall started the cyst to bleeding and enlarging. The automobile rides increased the bleeding and consequently the rapid progression of symptoms during the last week before the operation were explained.

The two following cases are examples of disease of the pituitary body:

The following case falls in Dr. Cushing's classification of pituitary disease in Group 1, representing those cases in which, along with definite constitutional disturbance, caused by defective glandular function, there are also neighborhood symptoms due to pressure.

CASE 7.—Male, aged 19, family history, negative. This boy was a full-term baby. He was normal in every way up to his eleventh year; at that age he began to lose his hearing, first in the left and then in the right ear, and gradually within a period of three years he became totally deaf. No other symptoms accompanying this deafness were observed. In July, 1914, five years after he had become totally deaf, he was taken suddenly sick with vomiting and severe pains in the left temple. The severe pain continued for four or five days, when a complete ptosis of the left eye occurred.

Examination.—When I saw the patient in August there was still the ptosis, a dilatation with paralysis to both accommodation and light of the left pupil, and some neuralgic pain at times. No other symptoms were observed. The Wassermann in the blood and the three reactions in the spinal fluid were negative. No satisfactory diagnosis was made at this time. On Feb. 8, 1914, I saw this patient again. The ptosis had almost completely disappeared, the pupil reacted to both accommodation and light and was nearly normal in size. In the seven months since my last examination the patient had gained 15 pounds in weight; his lips were somewhat thickened and protruding. His voice was falsetto in character. There was a development of his breasts and a rounding out of his hips which suggested the feminine type of form. About one month before his visit to me he began

to lose the vision in his left eye. An examination of the field of vision showed vision in the left eye almost entirely gone. He could barely distinguish as shadows one's fingers on the nasal side; on the temporal side he was totally blind. In the right eye his nasal vision was good, but on the temporal side it was gone. There was also a paralysis of the external rectus. The eye backgrounds were fairly normal in appearance. Very little pain was complained of. There was 0.5 per cent. of sugar in the urine and a mild polyuria. He got up about three times during the night to pass his water. A roentgenogram (Fig. 1) of his cranium showed an enormously enlarged sella, about 3 cm. in width and 2 cm. in depth, with the posterior clinoid process scarcely visible. The anterior wall of the sella appeared to project into the sphenoidal sinus. A diagnosis of tumor of the hypophysis was made and operation advised.

Operation.—This was performed on February 27, by Dr. Cushing. A hemorrhagic cyst situated in the center of the pituitary body was found; the contents were evacuated and the walls destroyed as well as possible.

Postoperative History.—The patient made an uneventful recovery. On April 24, less than two months after the operation, vision in the right eye was fairly normal, and in the left eye, fingers on both the nasal and temporal sides were easily counted by the patient. His voice had lost its falsetto character. Sugar was still present in the urine but in less than half the amount found before the operation. The neuralgic pain and polyuria had disappeared entirely.

Case 8.—Male, aged 14, family history, negative; personal history, up to time of present trouble, unimportant. In January, 1913, the patient received a severe blow on the right side of the forehead, just above the right eye, which rendered him unconscious for about ten hours. As a result of this blow there was a cut above the right eye about 1 inch in length, the scar from which is still plainly visible. On the day following the accident he complained of an attack of dizziness which lasted fifteen or twenty minutes, during which the objects in the room seemed to go around and he lost consciousness for a few minutes. The attack was followed by a headache. At first he had similar attacks every day, but after a few months they became less frequent, occurring at the present time two or three times a week. In these attacks he must always lie down or sit down. In the dizzy part of the attack he complains of a noise in his ears, which he describes as like the sound of a bell after it has quit ringing. In addition to the dizzy attacks he has periodic attacks, coming regularly once in three or four weeks, of severe headaches during which he is completely prostrated and vomits frequently a greenish fluid. The resemblance of these headaches to migraine in a patient with such typical symptoms of hypopituitarism leads one to wonder whether disturbed function of this gland may not play an important rôle in the causation of migraine in general. The patient's disposition is irritable. He has had two severe nosebleeds since his accident. He goes to school almost every day but usually comes home at 10 o'clock recess on account of headache. He has made no progress in school whatever since his accident although previous to the accident he made good progress. He has not cared to play or indulge in games with other boys. His appetite in general is poor. The patient's father and mother, as well as his brother and sister, are slender. Several days before his accident, dressed in a heavy sheep-lined coat he weighed 92 pounds; in May, 1913, his first weight taken after the accident, he weighed 114 pounds; on Dec. 29, 1914, 169 pounds; in March, 1915, 181 pounds, and in April, 194 pounds, making a gain of over 100 pounds in a little over two years.

Examination.—The physical and neurologic examination is in general negative. Equal parts of urine with Haines solution has at times given a complete reduction, with a reddish yellow deposit. The roentgenograms show a slightly enlarged sella, the width of which is 15 mm. and the depth 12 mm. The general appearance of the patient at first glance bears some resemblance to the myxedematous type. The face is anemic and puffy; the lips thick; the breasts and hips are greatly enlarged; the abdomen is protruding and in standing erect the limbs assume the knock-knee position observed in the female. The skin presents a mottled bluish appearance in many places. The hand is typical of this type of pituitary disease, the fingers tapering to very small end phalanges.

This case belongs to the third group in Cushing's classification, in which the neighborhood symptoms are wanting and the constitutional symptoms are predominant. These cases are especially interesting because they call attention in a striking manner to the remarkable constitutional changes which may be produced in a comparatively short time by the disturbance of functions of this little gland. When we reflect that this gland is only one of a number which seems to be intimately related in function and vitally important to our physical and nervous welfare, we are better able to realize the complex nature of life and the enormous difficulties which often confront us in accounting for symptoms and making diagnoses in so-called functional nervous disease. The number of cases reported is too small to permit of any general deductions. I wish to emphasize, however, two points mentioned in my introduction. First, the result in operations for brain tumors would be more often successful if our localization was studied more with reference to whether the growth was situated anterior or posterior to the tentorium. If this can definitely be determined decompression can be made to relieve the pressure symptoms at least for a while. Second, if no tumor or signs of tumor are found, let us not throw up our hands immediately, but endeavor in a rational and intelligent manner to ascertain if something further may not be done for the relief of the most trying symptoms.

Lowry Building.

ABSTRACT OF DISCUSSION

Dr. C. Eugene Riggs, St. Paul: Dr. Ball's paper recalls to all of us many interesting cases of focal brain disease. Among the number of hypophysial growths I have seen, I succeeded in referring one to Dr. Cushing. He operated; there was marked amelioration of symptoms for a year, with subsequent death. I have come to the conclusion that when epilepsy manifests itself after middle life, it is suggestive of syphilis or brain growth. I had a case, apparently of essential epilepsy—a young man—on going into the history of which I found that a year previous there had been trauma of the cranium. An exploratory operation was made and we found a cyst overlying the cortical area. Last year the *British Medical Journal* contained a reference to some thirty cases of brain tumor in which the symptoms had been absolutely masked by a psychosis. Recently I examined a case of Dr. Hammes' in which the patient apparently was suffering from a manic-depressive state. It was only toward the close of his life that any objective symptoms manifested themselves, and postmortem revealed a large growth.

Dr. Cecil E. Reynolds, Los Angeles: I was surprised to hear that in Dr. Ball's second case the surgeon undertook a subtentorial decompression without any localizing signs. I gather from Dr. Ball's paper that there was nothing to show any lesion under the tentorium, and I cannot see why that most excellent operation of Cushing—the subtemporal decompression—was not done in that case. The subtentorial operation is inconvenient from the standpoint of gravity, and, as Horsley pointed out many years ago, the danger of all brain operations increases as you approach the occiput and as you get near to Reid's base line. Personally, I think by far the greatest danger of operations for tumor is in the pressure. I do not think one can overestimate it. In all cases in which there is intense headache, vomiting and raised blood pressure, etc., I would do a subtemporal decompression before attempting to look for a tumor. The case of brain abscess

without assignable cause was particularly interesting to me. I operated in a similar case and reported it in THE JOURNAL in 1912, and Henderson reported a similar case about the same time in the *Lancet*. The case of jacksonian epilepsy which was cured by excision of the center was a particularly fortunate one. I have never been bold enough to cut out a center that appeared healthy to the naked eye, although in one case recently of jacksonian epilepsy in which the fits began in the hand, I found no localized lesion, but by my somewhat thorough palpation of the hand center I caused a paralysis of the arm below the shoulder which lasted for some weeks. During this time there were no fits, and I began to think that the child would remain well, but, unfortunately, when the paralysis cleared up the fits recurred. It is possible that if I had been as radical as was Dr. Ball, a permanent cure might have ensued.

DR. D. M. HANSEN, Lincoln, Neb.: I would like to ask whether Dr. Ball used the Roentgen treatment for hyperpituitarism. I think the majority of patients would consent to that more readily than to operation.

DR. G. A. MOLEEN, Denver: I do not think there is anything more flattering than finding a tumor where one has, through the study of localizing symptoms, presumed it to exist, and nothing is more elusive than a diagnosis based on what seemed to be certain symptoms. Sometimes radiographs may assist us, but only when we take very complete pictures. They should be taken from both sides and anteroposteriorly, and preferably stereoscopically. A good deal of accent is given to a picture if some of the bony configurations which should show through are blurred at a certain point. The more dense structures usually give a distinct shadow and therefore dense tumors should usually give a very striking shadow. On the other hand, I have had in my experience a cyst giving a distinct shadow so large that it was thought to be a defect in the plate, and yet when the cyst was opened on the operating table it was found to occupy almost the entire hemisphere. In a recent case of tumor the skiagram showed a distinct shadow in the neighborhood of the sella turcica. The symptoms were referable to the anterior portion of the temporosphenoidal lobe. There was not sufficient remaining of the optic phenomena to say that there was a bitemporal hemianopsia, since the blindness had already progressed to a great extent, but operation revealed an accumulation of fluid deeply situated in the anterior portion of the temporosphenoidal lobe near the middle line.

In reference to pituitary tumors, I have in mind a case (I do not know whether to say a boy or a man) 4 feet 6 inches in height, 28 years old. Growth stopped at 12 years following an attack of scarlet fever. Skiagram of the head showed a very large sella turcica. There was peripheral, bitemporal limitation of the visual field. His hands were small, there was no pubic hair and he presented an infantile appearance. The epiphyses of the phalanges and metacarpals were shown by the radiogram to be separated or ununited. This was undoubtedly a tumor of the pituitary body, but not with the usual hypertrophy—rather with a sudden cessation of development. I desire principally to emphasize that sometimes in the hands of good radiographers a skiagram (when taken bilaterally and stereoscopically) may be of considerable contributory value, but should not be relied on exclusively.

DR. C. R. BALL, St. Paul: To answer Dr. Reynold's question in regard to the second case as to why I decided to make a suboccipital rather than a subtemporal decompression, this was one of the points I wished to emphasize in my paper. There was pain and rigidity in the back of the neck, extending down between the shoulders, vertigo on changing position, intense headache, a high degree of choked disk; there was also asynergia as manifested by the walk of the patient; he threw his body and shoulders far backward and had to be supported in order to maintain his balance. These were the deciding factors which caused me to recommend the subtentorial decompression. I have never had any experience in treating hyperpituitarism with the Roentgen ray. I do not see from the location of the hypophysis how we could hope to affect it without also affecting the surrounding brain tissue. In shrinking up cysts of the pituitary body we would also be liable to shrink up brain tissue, which in most instances I would not consider a very desirable thing to do.

CHRONIC TETANY

REPORT OF CASE *

J. P. MUNROE, M.D.
CHARLOTTE, N. C.

Clinicians are constantly on the alert to find a definite pathology for those conditions classed as functional diseases.

In recent years an unusual amount of attention has been directed to the so-called "regulators" of metabolism, namely, the glands of internal secretion, and the vegetative nervous system.

In my opinion, many cases, heretofore designated neuroses, on thorough investigation would be found to have a pathologic basis along the lines indicated. In this particular class of cases, the parathyroid gland is perhaps more often at fault than is generally supposed. Along with this, a serious want of balance in the vegetative nervous system is often an important factor.

The classical definition of tetany is: "It is a disease whose symptom complex consists essentially in intermittent bilateral muscular contractions which are painful in character, and usually without loss of consciousness."

The pathology of tetany, as understood today, is based on the postmortem findings, the results of operations and therapeutic tests.

It is generally agreed that the underlying factor is deficient parathyroid secretion, that this causes deficient calcium content in the blood, and that a hyperexcitability of nerve cells and fibers results from this calcium deficiency. There are those who believe that this irritation affects chiefly the central nervous system. MacCallum's experiments, however, indicate that it is peripheral nerve irritation. It is probable that both the nerve cells and the nerve fibers are irritated.

It is interesting to note that Sabbatini's experiments with trisodic nitrate, a salt of citric acid, which renders inert calcium salts, will if injected into the system, cause tetany.

I wish to state parenthetically that in the treatment of the case here reported, the fruits containing citric acid seemed decidedly harmful, and it was only after fruits of this kind were prohibited that any improvement was attained.

Berkley and Beebe advanced the theory that the most important factor is a large increase in ammonia, resulting from certain metabolic changes, endogenous toxins or from the introduction of exogenous toxins into the system. They have produced tetany by injecting ammonia, and then relieved it with calcium salts.

Operative tetany has occasionally occurred from the unintentional removal of the parathyroid glands in operating on the thyroid. Crocker reports five cases in 1,000 operations, and Frazier was able to collect eight cases in 2,000 operations.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

The latest case reported that has come under my observation was reported by Johnston and Budd, at the Southern Medical Association, November, 1914. In this case, symptoms of tetany appeared thirty hours after operation, and death occurred in fifty-two hours, preceded by tetanic convulsions. The difficulty of protecting these little glands in thyroidectomy will be apparent by a brief reference to their anatomy. They consist of four small lobes of two on each side, each 6 to 7 mm. by 3 to 4 mm. by 1 to 3 mm. They lie behind the thyroid gland, and are closely adherent to it.

It is well at this point to refer briefly to the autonomic nervous system. We have two separate and distinct autonomic systems, enervating, smooth muscular fibers and the secreting glands, namely, (1) the sympathetic system proper, and (2) the autonomic proper, also called the vagal system in the wider sense.

Both these systems appear to be acting constantly, and in a certain sense are antagonistic to each other. A certain tonus exists in each system. Under normal conditions there is a sort of balance maintained between the tonus of the sympathetic proper and the autonomic proper or vagal system. For example, in a dim light the pupil is kept half way between contraction and dilatation. If the third nerve of the vagal system is stimulated, contraction results, whereas if the sympathetic system, which supplies the radiating fibers, is stimulated, dilatation would result.

Similarly the heart's contractions are kept at about 72 per minute under the balanced action of the accelerator nerves of the sympathetic system and the inhibitory nerves of the vagal system.

Both systems seem to be under a double control: (1) control exerted through the cerebrospinal axis; and (2) control dependent on the direct chemical action on the autonomic nervous system by substances called "hormones," which are derived from the glands of internal secretion. Sympathetic tonus appears to be kept up by a constant flow of epinephrin.

The posterior lobe of the pituitary gland has a similar action, selective, especially on the uterine muscle.

We do not know of any internal secretion exerting a similar effect on the tonus of the vagal system.

There are medicines, however, that are known to increase this tonus, and some have a distinctly stimulating effect. Then again, there are medicines which have a paralyzing effect. These facts form the basis of certain therapeutic tests. The medicines commonly used for these tests are epinephrin, atropin and pilocarpin.

Epinephrin increases sympathetic tonus and thereby tends to balance excessive vagal tonus.

Pilocarpin stimulates the vagal system, at least parts of it, and thereby balances excessive sympathetic tonus.

Atropin tends to paralyze or depress the nerves of the vagal system, and thereby has practically the same effect as epinephrin in cases of excessive vagal tonus.

Kahn and Falta, after demonstrating that tetany is not confined to the voluntary muscles, but extends as well to the autonomic nervous system, produced some evidence indicating that tetany is essentially a disease of excessive vagotonic condition of the nervous system. The case which I report seems to lend support to this view. Falta, by using a dose of pilocarpin that has practically no effect on a normal person, has shown that the same dose may produce acute dilatation of the stomach and cessation of peristalsis, if given in a case of tetany.

This suggests an interesting question, whether the term gastric tetany should be used to designate a distinct type. Jelliffe and White (page 109) say, "The course of tetany in gastric dilatation is toward a fatal termination, unless there is surgical intervention or relief of the dilatation." Cases of gastric tetany reported (Osler) are about thirty, with a fatality of 33 per cent. for patients operated on and 67 per cent. for those not operated on.

This would seem to indicate need of operation in cases of gastric dilatation in tetany.

If one were to judge by such experiments as those of Falta, cited above, or be guided by therapeutic results in the case which I report, perhaps the conclusion might be reached that gastric tetany is only an incident, sometimes present and sometimes absent in the general condition of chronic tetany.

It may at least be suggested that no patient should be operated on for dilatation until proper remedies have been used for balancing vagotonic and sympatheticotonic conditions.

J. S., woman, aged 26, single, first examined Aug. 8, 1914, had negative family history except that one sister was a great sufferer from bronchial asthma. Personal history was negative. The present illness began in the latter part of 1913. After suffering for some time with dyspepsia, the patient had an acute attack of indigestion which was followed by some sort of convulsion. After this, it was noticed that she had apparent hemiplegia of the left side. At infrequent intervals these convulsive seizures returned, and general prostration became very marked.

At present examination, patient is not able to walk without assistance, and the indigestion has been so pronounced that she has been using stomach pump and lavage every day.

It was some time after this examination that she was seen in one of these so-called convulsions. This came one day after a bath. This convulsion lasted several minutes, in fact was not relieved until sufficient chloroform was used to produce thorough relaxation. She appeared to be thoroughly unconscious, but it was afterward learned that she could hear and understand some things that were going on. The arms were sharply flexed, the hands closed and pressed so strongly against the neck as to interfere with respiration. Respiration was somewhat labored, but not changed in rhythm. The legs were rigid and cataleptic.

The nature of this attack, together with other symptoms and signs, left no doubt as to the diagnosis of chronic tetany.

Briefly, these signs and symptoms were as follows:

1. Bilateral spasms of the hands, lower extremities and respiratory muscles, as already described.
2. General muscular weakness and partial hemiplegia of the left side.
3. Gastric dilatation.
4. Transverse ridges on the teeth.
5. Chvostek's sign.
6. Trousseau's sign.

These in themselves appeared sufficient basis for the diagnosis of chronic tetany. At this stage of my study and treatment of the case, Dr. Barker of Hopkins happened to be in our city and gave a very interesting clinical lecture on this case, confirming the diagnosis.

It became an interesting study, however, in the further management and treatment of the case to note the symptoms referable to the autonomic nervous system.

In Van Oorden's tabulation of sympatheticotonic and vagonic symptoms, he presents in parallel columns about thirty-six symptoms in each group opposing or balancing

each other. In this case, there were only two that belonged to the sympatheticotonic, and these were not present very long, namely, urticaria and low gastric acidity.

On the other hand, there were present, more or less all the time, except when relieved by treatment, about twenty vagotonic symptoms, namely: myosis; frequent winking; frequent spitting; arrest of secretion of gastric glands; hypermotility of stomach and intestines; vomiting; enophthalmos; bradycardia; low blood pressure, 90 systolic; asthmatic attacks occasionally; pylorospasm; dermatographia; gag reflex absent; clammy hands and feet in later stage of case; eosinophilia in early stages; increased fat tolerance; increased sugar tolerance both before and after epinephrin; pilocarpin caused extreme salivation; atropin well borne; epinephrin well borne.

The patient's response to the therapeutic tests of epinephrin, atropin and pilocarpin was very instructive. A very small dose (1/20 grain) of pilocarpin produced excessive sweating and salivation. Epinephrin chlorid, hypodermically, was well tolerated, and on account of its quick action, more than once prevented a threatened convulsion. Atropin also was well borne, and by its use, pylorospasm was relieved, after which the gastric dilatation disappeared, as shown by roentgenogram, all of which would indicate that in this case we have not only deficient parathyroid secretion, but also a disturbed condition of the autonomic nervous systems.

Treatment.—Diet: The diet indicated in such cases consists of foods rich in calcium, as milk, eggs, etc. In this case no material improvement was obtained until diet had been limited to buttermilk. Later eggs, fish, chicken and vegetables were added.

Parathyroid gland tablets, from 1/20 to 1/10 grain each, have been given continuously and seem to be advantageous, but they are not of themselves sufficient to control the symptoms.

The powdered suprarenal gland is given in capsules, each of 5 grains, three times a day, and seem indispensable. In threatened convulsions, epinephrin chlorid, from 0.001 to 0.002 gm., usually wards off an attack. Under use of suprarenal powder, blood pressure was brought up from 90 to 110.

Powder of the pituitary body adds to the comfort of the patient and is given almost continuously in 5-grain doses. It does not seem so indispensable as the suprarenal powder.

Calcium lactate has been given in 20-grain doses three times a day and is indispensaable. Once, when calcium lactate could not be obtained at the drug store, calcium chlorid was substituted temporarily. It may have been a simple coincidence, but a convulsion followed a half hour after the first and only dose given, indicating, as some assert, that chlorids are harmful.

Atropin, 1/100 grain, given hypodermically, gave first relief to pylorospasms, and under its use for a short time the gastric dilatation gradually disappeared.

Later, tincture of hyoscyamus, in full doses, was given for a period of two weeks.

The patient had been using lavage daily. I gradually dispensed with this after beginning atropin.

Massage and electricity were used regularly while the patient was in the hospital. She was dismissed April 4, 1915, very much improved.

One complication surprised me, and I have not seen it mentioned in connection with any other case, namely, hemorrhage, apparently vicarious menstruation. The first hemorrhage came from the pharynx. A capillary oozing for several hours resisted all local and general treatment, until atropin was given, which arrested it promptly. This hemorrhage was estimated to have amounted to 2 or 3 pints, and caused extreme anemia and prostration lasting several weeks. There has been a second hemorrhage, occurring also during menstruation, since the patient left the hospital, this time from the bowels. I had neglected to give instructions to use atropin, and again a large amount of blood was lost.

The patient is still under the treatment outlined, and I do not consider her cured. A recent letter, however, says that she is doing well and hopes soon to go to the mountains.

ABSTRACT OF DISCUSSION

DR. J. T. FISHER, Los Angeles: In regard to this interesting report of a chronic tetany, Dr. Munroe has made two points which would lead me to think that perhaps in addition to tetany the patient was suffering from some functional disturbance which might be designated by some of us under a different heading. I wish to ask Dr. Munroe if, in his examination, in addition to the points he brought out, he determined whether or not the patient had limitation of the visual field or any sensory defects that we find in ordinary hysteria? The case at least had some of the ear marks of that most protean psychosis.

DR. JULIAN M. WOLFSOHN, San Francisco: I am glad to see that Dr. Munroe has attacked this important subject of tetany from the standpoint of the vegetative nervous system. So far there are very few cases of tetany that have been worked up with special reference to the vegetative nervous system. Using as a basis different tests, in one case of tetany that came under my observation, which I have described in THE JOURNAL of May 16, 1914, I have come to practically the same conclusion as Dr. Munroe. The majority of symptoms fall on the vagotonic side of the classification. An important keynote to the treatment of the case is thereby gained. It would be very interesting to have more reports, especially from the surgeons, who occasionally see artificially produced tetany, and from the clinicians who see these patients more often.

DR. CECIL E. REYNOLDS, Los Angeles: Can Dr. Munroe give us the physical signs of the hemiplegia that he spoke of? I know nothing about hemiplegic tetany, but its presence in this case certainly suggests a hysterical element. In many cases, when there is pylorospasm, this complication is so extremely distressing and lowers the patient's resistance to such an extent as to make manifest in a physical form deep emotional complexes preexisting in the mind.

DR. JOSEPHINE A. JACKSON, Pasadena, Calif.: I wish Dr. Munroe would tell us the whole story of this subject. Dr. Reynolds, Dr. Fisher and I on this western coast are inclined to view this case as hysteria. I do not recall any symptoms, as Dr. Munroe read his paper, that would be lacking in hysteria. The physical symptoms and loss of faucial reflexes might be present in hysteria. The contraction of the muscles, the obstetric hand, the overexcitability of the various reflexes, I find again and again in cases of hysteria. The cardiospasm and pylorospasm are exceedingly common in hysteria. The fact that the patient had this condition, marked at times, and then disappearing (elicited by pressure on the forearm) would suggest that the very attention that was paid to her in eliciting the symptom intensified the tonicity of her muscles. An increased excitability of the reflexes may obtain in conditions as widely different as that of hysteria from the normal condition of a parturient woman. All obstetricians know that if the woman is afraid of her physician, if she has no confidence in him and feels that he is some terrible bringer of instruments, all uterine contractions may cease when he comes into the room. The cause is purely psychic, of course, but it is sufficient to check the hormone formation that stimulates the lumbar cord which brings about contraction of the uterine muscles. The hysterical individual likes an audience, and must have attention. If this woman had the obstetric hand when she did not know she was observed it would more readily suggest tetany than having it only when being tested. The doctor described wonderfully well the influence of the vagotonic and sympathetic nervous systems. We are just touching the edge of knowledge of this subject. The interrelation between the influence of the psyche (mind) on this machinery of its own, and the influence of this machinery on the mind that is the master, is so close that we can hardly tell which inaugurates the activity of the other.

DR. FRANK R. STARKEY, Philadelphia: That tetany is at least at times hysterical in nature I am convinced, although the rôle of the autonomic nervous system and the relation between the autonomic nervous system and the glands of internal secretion would lead one to believe that these are

involved in many cases. One of the cases which rather vividly impressed on me the degree of suggestibility in this condition was that of a man who had been treated at a hospital in Philadelphia for a number of years for attacks of tetany. If he were pressed on the biceps (the foot on this side was markedly extended) he would immediately go into a very painful tetanic spasm. He was so aware of the description of his condition that I was satisfied suggestion had a good deal to do with it. I talked with him along the lines of complete recovery and said to him: "I have something here that will surely either completely cure this condition or greatly benefit you at once." I gave him 1/10 grain of calomel by mouth three times a day and he was completely well within forty-eight hours. That was four years ago and there has never been a return. It must have surely been a purely mental condition in his case and suggestion brought about recovery.

DR. GEORGE A. MOLEEN, Denver: I think to separate the dilator fibers of the pupil from the sympathetic system may possibly be an error. I think it has been rather clearly shown that the dilator fibers take their origin in the first and second sympathetic, which supply the auxiliary spinal system (ciliospinal) to be delivered to the radiating fibers through the ophthalmic branch of the gasserian ganglion. This is supported also by two or three pathologic conditions. Tumors of the gasserian are frequently followed by paralysis of the dilator fibers, as well as the same result in enucleations of the ganglion. Also the tuberculous glands of the neck which we see so frequently in Colorado have given rise to many theories for the anisocoria or unequal pupils seen with the dilatation on the same side. The character of the muscle fiber as well is sufficient to indicate its sympathetic supply. It is pretty well established that the dilator fibers like the circular fibers receive their supply from the sympathetic system. This is merely a matter of comment on what I understood Dr. Munroe to have said as to the supply of the pupillary fibers.

DR. J. P. MUNROE, Charlotte, N. C.: Dr. Reynolds asked especially about the hemiplegia. As a matter of fact, it was not a true hemiplegia. On examination I found that the weakness was general. There was no Babinski and it was not a true hemiplegia at all.

As to the suggestion that it may have been a case of hysteria, I will admit that on first examination I considered it hysteria, and it took me some time to reach a different conclusion. There were no stigmata of hysteria that I could detect. No contraction of the visual field. There was no emotional disturbance. The patient was one of the most even tempered people, always cheerful, and had a very bright disposition. Dr. Barker of Hopkins happened to be in our city when I had made my diagnosis, and he thought at first he had me up a tree, and gave a very interesting clinical lecture on this case before the county society. It was only in the latter part of the examination that he came to the conclusion that my diagnosis of chronic tetany was correct.

Working of Child Labor Laws.—The government has made inquiry into the working of the child labor laws of various states, and in a recent press bulletin has given a brief statement of the result of the inquiry in regard to the Connecticut law. In Connecticut a child cannot go to work until he is 14 and until 16 cannot work until he has an employment certificate. He cannot get a certificate and stay out of school unless he has a job. If he quits work the employer must notify the State Board of Education, and he cannot go to work again without a fresh certificate. This is the striking feature of the Connecticut law, that the Board of Education controls the enforcement of the law and dovetails it with the compulsory education law. Agents of the state travel from town to town issuing working certificates, inspecting shops for violations of the law and visiting the homes of children who have left their jobs. The government inquiry is in charge of Miss Helen Sumner, of the Industrial Division of the Children's Bureau.

DISTURBANCES OF THE ACOUSTIC NERVE

IN THE EARLY STAGES OF SYPHILIS *

GEORGE H. WILLCUTT, M.D.
SAN FRANCISCO

Although this subject has been presented by many during the past three years, I desire to give a brief summary of the work done along this line and add a few deductions of my own as a result of the examination of some 293 cases of syphilis, most of them in the first and second stages of the disease. During the year ending June 30, 1914, I examined these cases at the Ohrenklinik in Vienna under Professor Urbantschitsch and have tabulated my notes and appended them to this article for reference.

These cases were all referred to the Ohrenklinik from the skin clinics of Finger, Riehl and Ehrmann for otiatric examination prior to the administration of salvarsan, as great stress is laid on the aural contraindication in Vienna and great caution is taken to have a careful otiatric examination made previous to the injection.

The majority of patients examined were in the secondary stage, although a good number of primary, and a few latent cases are included in the list.

In summarizing these cases the most noticeable point is the almost constant shortened bone conduction, which Wanner[1] (1903) and Oscar Beck[2] (1911) called attention to some years ago as being of great value in the early diagnosis of syphilis. This condition had been reported previous to this time by Crockett[3] of Boston, but no stress was laid by him on its importance. Nov. 2, 1896, Crockett reported on three cases of acute syphilitic affection of the inner ear, and in all three cases he found a complete loss of bone conduction for a middle-register fork, while the air conduction was almost normal. He laid stress, however, at that time on the fact that in acute syphilitic cases, the loss of the low tones was usually not found, while the upper limit was somewhat lowered and did not bring out the importance of the lost bone conduction.

Wanner, to the astonishment of the internists, was able to make the diagnosis of syphilis in 95 per cent. of the cases he examined, before the appearance of any general symptoms, and the diagnosis was later confirmed by positive Wassermann reactions and characteristic findings. He made his tests with an a^1 (426 d. v.) fork, while Beck used the c^1 (256 d. v.) tuning fork in his cases. The accuracy of this means of measuring the bone conduction time was strenuously attacked as unreliable and valueless; but after further investigations the difference between the bone conduction of the syphilitic and nonsyphilitic cases, with but few exceptions, was so clear and marked that the electric forks and other methods for the more exact determination of such, were found unnecessary and discarded for all ordinary use. The use of the electric fork confirmed that such conditions as described were present in from 80 per cent. to 90 per cent. of the cases examined (Urbantschitsch).

Kabatschnik[4] of Kiew claims that the Schwabach and Rinné tests are never reliable, as bone conduction

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Wanner: Verhandl. d. deutsch. Otol. Gesellsch., No. 22, 1913.
2. Beck, O.: Verhandl. d. deutsch. Otol. Gesellsch., No. 22, 1913.
3. Crockett: Boston Med. and Surg. Jour., Feb. 11, 1897.
4. Kabatschnik: Monatschr. f. Ohrenheilk., 1912, xlvi, No. 11.

differs with the mastoid bone being of the eburnated or of the pneumatic type. There are some of us who agree with him to a certain extent, especially in cases in which the variation is of a very small amount, for we know the condition of the bone will cause such variations, but we certainly could not conceive of the condition of the bone being responsible for the great amount of shortening observed in connection with these reported syphilitic cases, in some of which the reduction was twenty-five to thirty seconds and in one case forty-three seconds.

In June, 1914, Emerson[5] of Boston read a paper to the Philadelphia Laryngological Society on "A New Test for Labyrinthine Disease of Specific Origin." Emerson, after giving a summary of Kerrison's classification of specific disease of the labyrinth, gives a very interesting paragraph on the hearing test he has found useful in the diagnosis of specific labyrinthitis. He says in part:

> Given (1) a bilateral affection, with marked lowering of the upper notes, (2) a positive Rinné test, (3) with low bone conduction and (4) normal low limits for the Dench fork, and the cause is probably syphilis. Eight cases out of ten so studied showed the Wassermann reaction either double or triple positive. . . . Kerrison, however, depends for his diagnosis upon (1) the diminished bone conduction, (2) a negative Rinné, (3) loss of hearing for the higher musical tones, (4) plus constitutional evidence of the disease.

Both Emerson and Kerrison have made diagnostic points of the lowered or shortened bone conduction, but differ on whether the Rinné test is positive or negative in these cases. Politzer, Rohrer, Urban, Oscar Beck, Emerson and others have found that the Rinné test is usually positive in these cases, while Kerrison[6] found it negative, especially in adults who have suffered from chronic constitutional syphilis over a period of years.

Whether the lesion is a toxic degeneration of the acoustic nerve or whether it is due to increased intracranial pressure, as held by O. Beck, remains to be proved; but unless a preexisting or concomitant middle-ear disease is not accounted for, one will find a positive Rinné test the rule. One is able to confirm this statement by referring to the table of cases added to this paper, as the only cases in which I found a negative or a plus-minus Rinné present had either adhesions, scars or perforations, and destruction of the drum and ossicles from an old middle-ear disease, or at the time of examination had an active middle-ear disease running its course.

I found a number of cases in which the air conduction was shorter than the normal, but in such the bone conduction was reduced to such a degree that it was still shorter than the air conduction and a positive Rinné was still present. Emerson also found that the air and bone conduction were both lowered in some of his cases, but their relation was such that a positive Rinné was present in every one of them.

Beck[7] found that the bone conduction was markedly reduced in comparison with the shortening of the air conduction in syphilitic affections of the inner ear and also that the lengthening of the bone conduction often could not be elicited in syphilitics having middle-ear disease, as is characteristic in a like condition in a non-syphilitic case. He cites a case of acute otitis media in a young woman in whom he found a typical otiatric picture, a swollen, reddened membrane with loss of all detail. There was a marked impairment of hearing in the affected ear, the Weber test lateralized to the affected side, air conduction was almost normal, but the bone conduction of the affected side was not lengthened. This led him to made a diagnosis of "acute otitis media, most probably in a syphilitic individual." The syphilitic infection was later admitted by the patient and the Wassermann was found to be very strongly positive. The bone conduction in this case was in all probability shortened some seconds before the onset of the acute otitis media, but was brought back to the normal by the middle-ear disease, so that the bone conduction was in reality lengthened by the middle-ear condition, although it did not pass the "normal point" in comparing with the normal bone conduction of the examiner.

I had a parallel case (Case 38) to this, in which a syphilitic patient developed an acute otitis media in the right ear. The drum was bulging and markedly injected. Light reflex and all normal landmarks were obliterated. The Weber test lateralized to the right ear. The Rinné test gave right, negative; left, positive. Schwabach test: right, lengthened three to five seconds; left, shortened twenty-two seconds. Eight weeks later, after treatment for the acute condition, a control examination was made and the following interesting changes were noted: Weber lateralized to left; Rinné test: right and left positive; Schwabach test: right, eighteen seconds short, left, twenty-one seconds short. After the healing of the acute otitis media, the lengthened bone conduction of the right ear returned to the shortened condition that was undoubtedly present prior to the onset of the acute disease. A striking point in this case is the variation found in the bone conduction of the right ear, this being from twenty-one to twenty-three seconds.

In considering this shortening of the bone conduction for diagnostic purposes, one must naturally make allowances for small differences in patients past the middle age, for we find the physiologic changes in the vessels present which lead to a shortened bone conduction in itself. One shrould, therefore, be guarded in laying stress on a slightly shortened bone conduction as suspicious of syphilis in patients past 50 years of age unless accompanied by the other diagnostic points, positive history of infection and a confirming Wassermann reaction. This also holds true in regarding such metasyphilitic types of the disease as paresis and tabes, for the patients are usually past the middle-age limit and the normal physiologic changes may have occurred.

Lewy[8] of Chicago, in a paper on "Some Curable Affections of the Acoustic Nerve," read before the Chicago Laryngological Society in May, 1912, takes up a group of cases in which there was a lessened hearing power for tuning forks, especially by conduction through the cranial bones and also a lessened hearing power for the spoken and whispered voice. These cases differed from actual acoustic nerve degeneration in that recovery followed appropriate treatment. He mentions forms due to general anemias of long standing, to general systemic depression, to neurasthenia, drug-intoxications, toxemias of various infectious diseases and constitutional diseases. These, with such other conditions as "occupation deafness,"

5. Emerson, Francis P.: Laryngoscope, 1914, xxiv, No. 10.
6. Kerrison: Diseases of Ear, Philadelphia, J. B. Lippencott Company, 1913.
7. Beck, O.: Ann. Otol. Rhinol. and Laryngol., 1913, xxii.
8. Lewy: Laryngoscope, March, 1913.

myxedema, hydrocephalus, brain tumor, meningitis and epilepsy, may give a shortened bone conduction; but by a careful systemic, clinical and functional examination, one is able to differentiate these cases in the great majority, make a definite diagnosis and employ a suitable treatment. Lewy includes syphilis under the "infectious diseases" classification and reports a case with complete recovery after the use of intramuscular injections of mercury over a very short period of time.

A few words as to the probable cause of this reduced bone conduction in syphilis would not be amiss. Knick and Zaloziecki[9] state that in all cases of disturbances of hearing in the early stages of syphilis examined by them in the Ohrenklinik at the University of Leipzig, they found a concomitant syphilitic meningitis present, which they proved by lumber puncture, cytologic and chemical examinations and Nonne-Apelt and Wassermann reactions on the spinal fluid. They hold that the cause of the disturbance is probably to be found in a syphilitic infection of the nerve sheath.

A great deal of work on the study of the spinal fluid with reference to the involvement of the nervous system in the early stages of syphilis has been done by Wile and Stokes[10] at the University of Michigan Hospital with very interesting and instructive results, but personally I had no opportunity for doing this work in the series of cases I report due to objections on the part of the chiefs of clinics in the Allgemeines Krankenhaus.

Oscar Beck has observed that following lumbar puncture in syphilitic cases, the shortened bone conduction tends to become normal again within three or four hours after the procedure, returning gradually to the shortened condition after two or three days' time. This caused him to believe that the shortening is due to an increase of intracranial pressure and that in those cases of syphilis in which no increase in pressure is found, no shortening of the bone conduction is present.

In all of Knick and Zaloziecki's cases the spinal pressure was increased, to a certain degree, and although they failed to state whether the pressure was measured in the vertical or horizontal position of the patient, the increase, in either case, is sufficient to be considered. According to Plaut, Rehm and Schottmüller, the normal cerebrospinal pressure, measured in the horizontal position, is from 10 to 12.5 cm. of water, while in the vertical or sitting position it increases to 20 cm. I have tabulated here the cases mentioned, that one may see at a glance (1) the duration of the syphilitic infection, (2) increase of cerebrospinal pressure, and (3) the phase of the Nonne and Wassermann reactions in the cerebrospinal fluid.

It is interesting to note that in all of their cases, with the exception of one (Case 6) in which a right-side chronic otitis media was present causing a negative Rinné on that side, the Rinné was invariably positive and the bone conduction was shortened an appreciable amount. In Case 6 the bone conduction was very short, notwithstanding the existence of a middle-ear disease. It will be noticed that the duration of the disease in these cases was from seven weeks to eight months, and although it is now generally accepted that during the first months of a syphilitic infection the fate of that patient with regard to the incidence of cerebrospinal syphilis is in all probability determined, one hesitates to believe that a syphilitic meningitis could be developed to such an extent, in so short a time as seven weeks, to cause an increased cerebrospinal pressure of sufficient degree to account for the reduced bone conduction as Oscar Beck's theory explains it. In Beck's tabulated cases included in his article "Bone Conduction in Syphilis,"[7] he gives eleven cases, with a duration of between eight days and one month, in which the shortened bone conduction was present. In the series of cases I have tabulated, I find fifty-two cases (17 per cent.) of a month's duration or less, showing a definite reduction in the bone conduction and in which every condition except syphilis was excluded as a cause for such shortening. In the same series of cases, six cases of a month's duration or less failed to show this symptom. The diagnosis in all of these cases was made positive by examinations of smears from the primary lesion and demonstration of the *Spirochaeta pallida*, or by the positive history of infection (Case 68). The Wassermanns in the blood were not yet positive, five to six weeks after the inoculation being about the earliest for such reaction to appear in the average case. No glandular involvement nor any other sign of general syphilis was present in any of these cases. Still I found a reduced bone conduction. What is the explanation of this condition?

VARIOUS FINDINGS IN CEREBRO SPINAL FLUID IN SYPHILITIC CASES

No.	Duration of Syphilitic Infection	Cerebrospinal Pressure in cm. of Water	Nonne Reaction (Cerebrospinal)	Wassermann Reaction (Cerebrospinal)	Remarks
1	Initial lesion and eruption present	28	+	+	Exact duration of disease not stated
2	Seventh week Ninth week	35 18	+ +	+ + +	Five weeks after "606" injection After further injections
3	Two months	24.5	+	—	Two weeks after injection for initial lesion, prior to eruption
4	Three and one-half months	23.5	+	+	
5	Seven months Eleventh month	23 11	+ —	+ + —	Three weeks after "606" injection Deafness, right ear; normal, left ear
6	Eight months Ninth month	8-9 21-22	+ +	+ + +	Seven weeks after "606" injection
7	Eight months	16-17	+ +	+ +	

9. Knick and Zaloziecki: Berl. klin. Wchnschr., 1912, Nos. 14-15.

10. Wile, Udo, and Stokes, John H.: Jour. Cutan. Dis., September, 1914; Further Studies on the Spinal Fluid with Reference to the Involvement of the Nervous System in Early Syphilis, THE JOURNAL A. M. A., May 1, 1915, p. 1465; Involvement of the Nervous System During the Primary Stage of Syphilis, ibid., March 20, 1915, p. 979.

After a careful consideration of this question I believe the explanation of the condition can be satisfactorily given in one way. There is without doubt an excretion of toxin or endotoxin into the system beginning very shortly after inoculation and increasing in amount during the period of multiplication of the spirochetes. This toxin is carried through the body by the blood stream. The toxicity of this is not sufficient to affect any of the organs except the most sensitive ones. For this reason we have no general signs or symptoms elicited until the amount of toxin is sufficient to overcome the protective agents of the blood, resulting in the skin eruption and the beginning of the secondary stage. At this time we find that the Wassermann reaction is positive, owing to the excess of alleged antibodies in the blood.

The central nervous system, being the most sensitive tissue, is the site of the first disturbance due to the action of the toxin, although still in minute quantities. The brain, meninges and cranial nerves are subjected to the toxin, and symptoms of irritation result. The brain is not so frequently affected as the cranial nerves, especially the auditory, optic and facial, but in a number of early cases I have found patients complaining of headache, and this is, to my mind, to be explained by a low grade of syphilitic infection or toxic irritation of the meninges. I do not believe this can be due to an increased intracranial pressure in this primary stage, as Beck explained it, any more than I believe the shortening of the bone conduction is due to it.

The disturbance of the acoustic, optic and facial nerves found in these early primary stages is undoubtedly due to a toxic syphilitic irritation of the nerve sheaths and also of the peripheral end-organs, these being most sensitive to the toxin. As these develop an immunity to the toxin, we find a slower progression of the symptoms or even their complete cessation at times, perhaps never again to recur.

The acoustic nerve appears, for some unexplainable reason, to be the most sensitive of the cranial nerves and for that reason we find a greater percentage of affections of this cranial nerve in the early stage. It is also shown by examination that the cochlear branch is affected to a far greater degree than the vestibular branch although in a number of cases I found both cochlear and vestibular branches affected, and in a few cases (Cases 62, 105, 138, 188, 194, 226) I found the vestibular branch affected more than the cochlear branch.

Knick and Zaloziecki[9] concluded their article with the statement:

> In all examined cases of disturbances of hearing in the early stages of lues, there exists at the same time a luetic meningitis, proved by lumbar puncture. Accordingly the cause of the disturbances is probably to be found in a luetic infection of the nerve sheaths.

This concurs with my opinion, although the cases reported by these men were all in the secondary period, but they do not state that such is their belief concerning the primary cases.

Voorhees[11] makes the statement in his interesting article "Notes on Syphilis of the Ear, with Especial Reference to the Use of 606," that we find affections of the cochlear branch (most common), vestibular branch or both branches of the acoustic nerve in early syphilitic cases and that patients, at the same time, may show symptoms of a polyneuritis cerebralis syphilitica. These conclusions of his, however, were also made after examination of a number of cases of the secondary stage.

Another interesting statement of his, of a condition which I have observed in a couple of cases, is that the nerves may be affected as they enter the internal auditory meatus and give symptoms of cochlear, vestibular, facial and trigeminus irritation, the so-called "Frankl-Hochwart's disease." This condition, also known as "polyneuritis cerebralis menieriformis," is more frequently due to a rheumatic affection of the basal nerves of the brain, but is occasionally seen in syphilitic cases. In this condition the prognosis of the vestibular affection is usually fair, but that of the cochlear should be guarded, as a great degree of deafness usually results.

Professor Voss[12] in his article on "Hör- und Gleichgewichts-störungen bie Lues" concludes with a summary in which he says:

> The existing pathological-anatomical changes laid to the diseases of the inner ear are local signs of a co-existing or preceding, but healed, meningitis cerebrospinalis luetica and that it results in neurological changes of the acousticus nerve and in inflammatory symptoms of the peripheral end-organs of this nerve.

He also states that the affection may be unilateral or bilateral and can affect the nerve as a whole or one only of its component parts.

His view that the diseases of the inner ear appearing in the course of syphilis are, almost without exception, the results of a general infection, I do not consider correct unless he means that they may be due to a general dissemination of the toxin throughout the body before the appearance of general symptoms or in those cases that do not develop acoustic disturbances until the secondary or tertiary stages.

Professor Wile[10] states that the nervous system may be, and probably is, frequently involved before there are other evidences of the hematogenous spread of the *Spirochaeta pallida* from the site of the initial sore. Such involvement may be slight so far as clinical symptoms go. Serious involvement may, however, occur extremely early with very marked changes in the cerebrospinal fluid and with definite impairment of the nervous function. The clinical changes most commonly noted in this preroseolar period are headache, involvement of the optic and acoustic nerves and increased reflexes. I, personally, staunchly support this view and think it substantially supported by the cases reported by him and by those I present herewith.

I also disagree in some points with Voss' statement that the diagnosis of a syphilitic affection of the acoustic nerve is founded on (1) the preceding syphilis, (2) the characteristic functional tests of the cochlear and vestibular nerves, (3) the eventual sympathetic affection of the other cranial nerves, (4) the existence at the same time of other syphilitic symptoms, especially from the inflammatory changes in the cerebrospinal fluid, and finally on (5) the eventual improvement to complete recovery under suitable treatment. Some cases may lack all but one or two of these symptoms, especially the early primary cases of the disease, and the characteristic functional tests and initial lesion are the only symptoms present. As before stated, this primary nerve affection is not always present, but it is found in the great majority of cases sufficiently well marked to lead an otologist immediately to consider syphilis as

11. Voorhees: Am. Jour. Dermat., April, 1912.

12. Voss: Verhandl. d. Otolog. Gesellsch., No. 22, 1913.

a probable cause in cases in which there is no other cause for the symptoms present.

Before briefly referring to the use of salvarsan in cases of syphilitic affection of the acoustic, I wish to add one or two facts that I have noticed in this work. In the secondary stage of the disease, I have found the bone conduction shortened to a greater degree in cases that have had no secondary eruption and to a lesser degree in those with a marked and general eruption. This has also been observed by Beck, Voorhees and others. The prognosis of the nerve affection is more favorable in cases showing an extensive eruption than in those not showing such.

I have also observed that in some cases in which there is a great difference in the amount of shortening between the two sides, there also exists an appreciable difference in the reflexes of the two sides of the body. I do not make the statement that such a condition is always present, nor have I investigated the cause, but the condition has been noticed and should be further studied.

I do not care to go into the subject of the use of salvarsan in acoustic disturbances to any great degree, for many opinions are expressed on the subject with almost as many differences, but I will briefly review a few of those expressed by men of much experience in the use of the preparation and add that I believe the individual case must be carefully studied before one can say there is or is not danger in the administration of the specific.

Professor Wile has told me that he had yet to see a case of deafness following a small dose of salvarsan among all of the cases treated at the University of Michigan during the past three years, that proved to be permanent and did not clear up on further salvarsan therapy, combined at times with mercurial treatment.

Wile believes the secret of salvarsan therapy is to employ a minimal initial dose of 0.3 gm., repeating the injections at intervals of from four to seven days, varying with the individual case, until the full dose is reached, the patient receiving from three to five or more injections. He grades his dosage about as follows: 0.3 gm., 0.45 gm., 0.5 gm. and 0.6 gm.

With the excellent results reported, this method should have due consideration, and if tried by the skeptic may prove of great value in the future treatment of these cases.

Dr. Charles M. Smith in his article "Use of Salvarsan in Ear, Nose and Throat Manifestations of Syphilis," read at Boston in November, 1913, says he believes that if aural symptoms develop in syphilis either before or after the use of salvarsan there should be an immediate and thorough use of either salvarsan or neosalvarsan. He also believes that the auditory nerve lesions following the use of this treatment are due to the specific infection and not to the arsenic of the salvarsan.

Harris,[13] in his paper "Administration of Salvarsan," says that the nervous complications of the therapy should be divided into two types: (1) syphilitic and (2) toxic. He places the auditory nerve affection in the first of these, as the most common nerve affected in either or both of its branches. He claims it is important to recognize the fact that this complication is due to insufficient treatment and usually recovers under energetic antisyphilitic treatment either with mercury or the salvarsans.

Beck[14] of Chicago reported in May, 1912, forty-seven cases of syphilis in his own practice, with positive Wassermann reactions, in which salvarsan acted marvelously in every case with no complications affecting the auditory nerve. He refers to the number of auditory nerve affections on record following the use of salvarsan, but after investigating these and obtaining subsequent reports, he found practically not a case of permanent injury to the auditory nerve from the use of salvarsan. Most of the cases cleared up on continuing the antisyphilitic treatment of salvarsan, mercury or potassium iodid.

Regarding the opinions of some of our foreign authorities, Zaloziecki says the relapse nerve conditions, or "neurorecidives" after the use of salvarsan, differ in no way from other early syphilitic affections of the cranial nerves, and are, for the most part, manifest syphilitic meningitis cases. H says he has as yet no reason for attributing to salvarsan a neurotropic action.

Professor Voss claims that the increased number of inner affections in secondary syphilis reported since the introduction of Ehrlich's salvarsan, is to be traced back to an underdose of the remedy. He believes the best results are obtained by the combined salvarsan-mercury treatment and advocates most energetic treatment as well.

These opinions are not accepted by some of the Vienna and Berlin men. Oscar Beck of Vienna still holds to his original view that ear affections appearing from four to eight weeks after the injection of salvarsan are contraindications to any further salvarsan therapy, as we are still in doubt what rôle salvarsan plays in the origin of these so-called "neurorecidives," whether inducing unusually early changes in the cerebral vessels, basilar meningitis, toxic nuclear disease or disease of the nerves in their narrow canals. He maintains the safest therapy in these cases is a strong mercurial treatment.

The question that remains to be solved after all the pros and cons are discussed is: Does or does not salvarsan cause such a toxic degeneration of the cranial nerves, especially the acoustic nerve, as is sometimes seen after the use of other arsenical remedies?

240 Stockton Street.

13. Harris, Frederick G.: Index Oto-Laryng., February and March, 1914.

14. Beck, Joseph: Ann. Otol. Rhinol. and Laryngol., September, 1912.

Health Department and Automobile Accidents

A recent *Bulletin of the Health Department* notes the fact that thirty persons were killed in the streets of New York City by automobiles during the month of May and blames the legislature for statutes which do not offer sufficient protection to the pedestrian and which expressly prohibit any local authority from enacting supplementary protective regulations. The bulletin points out that it is the clear duty of the authorities to see to the competency and trustworthiness of every would-be operator is satisfactorily established and that if the legislature is unwilling to enact protective regulations applicable throughout the state, that a request be made that the hands of the Board of Aldermen and the Health Department be untied so that they may adopt an ordinance which will compel those who desire to operate motor vehicles in the streets of the city to submit to an adequate test of fitness as a condition precedent to the obtaining of a license or permit. The support of all the people of the city is desired in order that this demand may be made when the next legislature convenes.

SYPHILIS OF THE INTERNAL EAR (HEREDITARY) *

HILL HASTINGS, M.D.
LOS ANGELES

The patient, a girl, aged 20, was referred Dec. 18, 1914, on account of dizziness, deafness and noises in both ears. The dizziness dated back four months and of late had grown worse. The dizziness was not attributed to the ears. Four years ago there was slight roaring and very slight deafness in the right ear for which she was treated in the East and apparently cured. A year ago noises of a roaring character, and deafness, again began in the right ear and a little dizziness was noticed. In September, 1914, deafness and noises in the left ear appeared with severe spells of dizziness. This gradually grew worse until at the time of consultation she was almost totally deaf in the left ear. The patient claims that she has had, during the past year, attacks of deafness that were as severe as the present deafness, but that they would rather suddenly clear up to a great degree, only to recur again. Since November 1 the dizziness has been very severe, so severe that she would have to sit down quickly to keep from falling.

Her general health has always been excellent. The tonsils and adenoids were removed in her childhood. She has not been subject to head-colds. She had trouble with the eyes when a child (interstitial keratitis) which will be referred to later.

Family History.—The patient's father had lues before he was married; his wife was infected before the child was born. Both were apparently cured and they have remained free from symptoms since. There was considerable apprehension at the time of the birth of the child, but they were relieved to find that she was perfectly well. They were not aware of the connection between their trouble and the present ear trouble; nor were they aware of the cause of the former eye trouble.

Physical Examination (Dec. 18, 1914).—The patient is a strong, active, well-built girl, apparently healthy in every way, except as noted. The teeth show decidedly suspicious signs of hereditary syphilis. The canines, upper and lower, are decidedly pegged and small, of white, chalky color, with the biting end worn off to a small, flat cusp. The incisors, upper and lower, are very small, of poor luster, somewhat pegged, with biting surface worn. The nose and throat are normal except for a deflected septum. Both drum membranes are dulled and somewhat retracted; the eustachian tubes open normally with a catheter, without any moisture apparent either in the tympanum or tube, and inflation did not improve the hearing.

There is complete deafness in the left ear to acoumeter, whisper, speech and all forks. Loud speech was heard in the left ear, but she was not able to distinguish the words. In the right ear the acoumeter was heard at 4 feet, a whisper at 20 feet, conversation at 6 feet, dim. There was considerable elevation of the lower tone limit, C/64 and c/128 forks were not heard; c^1 (256) reduced (25 seconds), as are also c^2 and c^3; c^4 fork is heard well, almost normal. The Galton whistle is heard almost normal in both ears (using the noise apparatus in the ear not tested). There is no spontaneous nystagmus. The use of the Siegle otoscope in the left ear produced considerable dizziness and immediately caused a marked nystagmus to the right ("fistula symptom"); the patient had to lie down. Nystagmus was markedly controlled by looking to the left side. The dizziness and nystagmus that were produced lasted about fifteen minutes.

Bone conduction was markedly decreased on both sides; on the left mastoid no fork could be heard; on the right mastoid bone conduction was reduced considerably; the Weber test was uncertain (the patient could not hear forks on the top of the head). On account of the evident lesion of both parts of the eighth nerve and the history of interstitial keratitis and the Hutchinson-like teeth, lues of the labyrinth was diagnosed and the family history obtained from the father, as above noted.

The patient was referred for a Wassermann and an eye examination. The blood Wassermann was reported as probably negative; there was a slight reaction but not sufficient to be considered at all positive. A spinal Wassermann was objected to. The eye report (Dr. A. L. Macleish) was the following: "Patient has slight oscillatory nystagmus in each eye, most obvious when she looks intently; the eye wanders away with an oscillatory movement. Ophthalmoscope shows numerous delicate vessels in each cornea, apparently just outside of Bowman's membrane; most close-set at periphery, but showing also in the lumen; apparently not containing blood; typical of interstitial keratitis after the exudate has been absorbed; more close-set in right eye. View of fundus in right eye a little clouded, but no lesion of either fundus found anywhere. Nerve heads and vessels normal." Dr. Macleish thought the eye condition was the result of inherited lues.

The patient was immediately put on mercurial treatment, inunctions 1 dram a day.

On Jan. 8, 1915, twenty-six days after the first examination, there was improvement in the left ear, hearing for conversation at 3 feet; slight hearing for low tones developed; C/128 fork could be heard fairly well, Galton whistle heard up to 25; there was still no bone conduction to be obtained through either ear. The right ear, on the other hand, had become markedly deaf—conversation had diminished from 6 feet to 6 inches. There was nothing in the middle ear or tube to account for this deafness. The tube opened large and free without any sign of middle-ear inflammation. The rapid decrease in hearing in the right ear was accompanied by a severe dizzy spell; she was walking, and had to sit down; there was considerable nausea for about one hour; the dizzy spell passed off when she went to bed. No nystagmus was present when she was seen in the office and pressure with the Siegle's otoscope failed to develop nystagmus, as found at the first visit. It appeared that the increased deafness in the right ear followed this dizzy spell. For three or four days there were slight attacks of dizziness with a constant feeling of fulness in the head.

March 5: After three months of mercurial inunctions the patient has improved so far as the dizzy spells are concerned. She has had very slight dizziness on getting up in the morning, but no more severe attacks. Hearing has remained about the same in the left ear; the right ear has improved slightly, conversation going up to 6 feet, high tone limit going up to Galton 15.

March 29: Hearing in the right ear has gone up to 20 feet for conversation, though still poor in the left ear. The patient's vestibular reaction to turning, and to hot and cold irrigation, was tried. It had not been tried earlier because the patient and her family were opposed to anything that might bring back the dizziness. We were surprised to find no nystagmus response whatever either from turning or from the use of hot or cold water in each ear. Two quarts of cold water, 68 degrees, were used in each ear and later 2 quarts of hot water (118 degrees) were used in each ear.

April 9: Hearing for conversation in the left ear improved to 10 feet and hearing in the right ear dropped back to 1 foot. Bone conduction, however, again apparently disappeared; she failed to hear the C fork or A^1 fork. The vestibular reaction was again tested as before, in the presence of a consultant, and there was absolutely no response to turning or to hot or cold water irrigations, using the same temperatures as before, hotter than ordinarily could be borne, 118 degrees. Equilibrium was good so long as she kept her eyes open, but with eyes closed there was considerable sway-

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ing, and on attempting to walk a line with eyes closed there was very marked staggering—not more to one side, however, than to the other. The fistula symptom could not again be elicited.

May 3: Except for a few slight dizzy spells she has been comfortable now for nearly four months. The vestibular reaction was again tested without any response from turning with head erect, but with chin on chest slight rotary nystagmus developed on rotation. This was of short duration, but plainly seen and was developed on turning to either side. In previous examinations for developed nystagmus this position of the head had not been used, so we do not know whether this might not have been found at an earlier examination. It apparently indicated that there was some response from the superior canal. The patient's equilibrium with the eyes closed was then tested and found as follows: With head erect, face forward, she felt as if she was falling to the left and backward. With head erect, face to the right, the tendency was to fall to the left and backward; with head erect, face to the left, she felt like falling to the right and backward. Pointing tests with each hand and forearm were apparently normal except with the right hand which showed a slight tendency to point to the left. The pupils responded normally to light and accommodation.

May 20, 1915: There has been a gradual improvement in the left ear—hearing for conversation, 4 feet; forks, C/64 vibrations not heard, but c^1, c^2, c^3 and c^4 were all heard, but reduced in time. Galton heard up to 30; whisper is markedly good, 20 feet plus, although bone conduction is still absent for c, C and a^1 forks. Hearing in the right ear has not improved; hearing for conversation, 3 feet, C not heard, all the other forks heard by air conduction—no fork by bone conduction. Again, as in the left ear, a whisper is heard unusually well, 20 feet plus; Galton heard up to 20; acoumeter likewise is heard 10 feet left ear, and 4 feet right ear. Treatment was then changed from mercurial inunctions to salicylate of mercury, intramuscular injections. A spinal Wassermann test was not made because the family objected, nor was salvarsan used for the same reason. A second blood Wassermann was negative.

The interesting points in the case are: (1) the hereditary history; interstitial keratitis, signs of which remain; the appearance of the teeth which was markedly suggestive, although not absolutely typical, of Hutchinson's description; (2) the rapidly progressive nerve deafness in the left ear, coincident with severe dizziness; absence of bone conduction and temporary complete deafness to all forks and all sounds except loud conversation; partial return of hearing and cessation of dizziness; (3) later, the rapidly progressive nerve deafness in the right ear, likewise accompanied by attacks of dizziness; (4) failure to develop nystagmus from rotation or from hot or cold water irrigation, except as noted with chin on chest position; (5) the "fistula symptom" in the left ear, which has been reported by Alexander as suggestive of lues of the labyrinth.

Our interpretation of the case is that the severe dizziness complained of before the first examination, associated with almost complete deafness in the left ear, was due to syphilitic involvement of the left labyrinth which was active when I first saw the case; and that the dizzy spells later complained of, which were associated with increase of deafness in the right ear, were due to similar syphilitic changes in the right labyrinth.

The fistula symptom observed, as well as the response to rotation only in the chin-chest position (1 canal active) also suggests that the lesion is in the labyrinth rather than in the nerve trunk.

Trust and Savings Bank Building.

AUDITORY NEURITIS *

GEORGE P. WINTERMUTE, M.D.
SAN FRANCISCO

The following cases may be considered as fairly typifying the symptoms and findings in neuritis of the eighth nerve:

CASE 1.—J. B., a man aged 31, stated that he was perfectly healthy until nine days previous to the examination, when he had a severe attack of influenza, and in sneezing he noticed that his right eye did not close, and that the angle of the mouth on the right side did not move. This was followed in a day or two by tinnitus, and the day before the examination he was attacked by dizziness and vertigo. Examination showed Shrapnel's membrane thin and retracted.

EXAMINATION OF RIGHT EAR

Conversation	5 meters
Weber	in the head
Rinné	positive
Schwabach	shortened slightly
C 1	positive
C 4	positive
Spontaneous nystagmus	present: horizontal to the right on looking to the right; horizontal to the left on looking to the left; negative looking straight ahead.
Turning Reaction	Turning right 40 sec. Turning left 30 sec.
Caloric	positive
Galvanic	positive with 3 milliamperes

Diagnosis: A case of neuritis just starting, with the cochlear nerve very slightly affected; the vestibular more so, but still giving a good reaction. The facial showed paresis, but not complete paralysis.

A Wassermann reaction proved positive. Under prompt antisyphilitic treatment of inunctions of mercury and administrations of potassium iodid the case cleared up within six weeks, and was then lost sight of.

CASE 2.—A man aged 28, was infected by syphilis, and six weeks later had macular exanthems. His hearing had always been normal. He received 0.4 gram of salvarsan intravenously, and his skin symptoms disappeared. Six weeks later he was attacked with strong tinnitus, and he consulted an aurist who told him he could find nothing abnormal.

The patient was then attacked by vomiting, dizziness and staggering. Eight days after his tinnitus he became deaf in the right ear, and tinnitus began in the left ear. Two days later he became deaf in both ears. Examination showed the drums to be normal.

EXAMINATION OF EARS

	Right Ear	Left Ear
Conversation	deaf	ad concham
Weber	not heard	
Schwabach	negative	very short
Spontaneous nystagmus, present; to the right on looking to the right; to the left on looking to the left		
Caloric	negative	negative
Spontaneous pointing error followed his nystagmus		

Turning to right and left gave no perceptible change in his nystagmus.

Ataxia was present, but was not typically vestibular. A Wassermann was done and was positive. The patient was put on injections of mercury salicylate which were continued for a month. At this time another Wassermann was done which was negative. He was then put on mercury inunctions, and given iodid internally for twenty-five days, when he developed diarrhea, and the ear condition showed no change. He was then put on injections of pilocarpin for a month. At this time the vestibular nerve showed signs of recovery. Turning to the right gave nystagmus

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15 seconds. Turning to the left gave 15 seconds. Caloric remained negative. The hearing showed no change. The patient at this time passed out of observation.

CASE 3.—A man aged 43 had been hard of hearing in the left ear for twenty years, has had for two years a discharge in the right ear. For two years has had a keratitis in the right eye; and has had enlarged inguinal glands. He has been dizzy since the age of 15. His hearing in the right ear was good until two years previously. He consulted an aurist, and after fourteen days' treatment he suddenly became deaf. (This may be regarded as a coincidence.) Afterward his hearing improved. Six months previously a radical operation was performed on the right side. Four days after the operation he was attacked with vomiting, dizziness, nystagmus of the third degree and facial paralysis. The caloric reaction was present.

EXAMINATION OF EARS

	Right Ear	Left Ear
Conversation	deaf	deaf
Schwabach	very short	very short
A	positive with hard stroke	positive with loud stroke
C 1	negative	negative
C 4	negative	negative
Spontaneous nystagmus, absent		
Spontaneous pointing, normal		
Turning to right	7 seconds	turning to left 7 seconds
Pointing after turning in both directions showed a trace of normal deviation		
Fistula sign	negative	
Caloric	slightly present	slightly positive

Diagnosis: Syphilitic neuritis on the left side. On the right side it is questionable if the patient had a serous labyrinthitis following the radical operation, or whether he developed a neuritis on this side. The fact that he became suddenly deaf in the ear, followed by improvement, together with his syphilitic history, the nerve lesion on the opposite side, with coincident facial paralysis, renders the diagnosis of neuritis on the right side the more probable. Subsequent improvement under antiluetic treatment confirmed the diagnosis.

From these cases we see that auditory neuritis is a disease coming on suddenly, as a rule, producing tinnitus and deafness when the cochlear branch is affected; producing dizziness, vertigo, disturbance of equilibrium, spontaneous nystagmus and probably vomiting when the vestibular branch suffers; and a combination of these symptoms when both branches are involved.

ETIOLOGY

The disease, in the great majority of instances, is due to syphilis. Moran reports cases due to alcoholism. Large doses of some drugs such as quinin and the salicylates have produced it. I, personally, saw a case in which the patient died a few days after the onset of the symptoms, and the postmortem showed hemorrhagic nephritis, a degenerated liver and the brain cloudy (as seen in alcoholics). The neuritis had been due to toxemia from internal diseases. While toxic cases are occasionally seen, the great proportion of cases seen clinically are syphilitic, and with the exception of the initial period it is found in all the stages of syphilis, including the hereditary.

It is not within the scope of this paper to discuss the pathology of the condition, further than to say that the lesion is in the nerve itself, and not in the labyrinth, as was formerly supposed. It is a mooted point whether the central or peripheral neuron is first attacked. Microscopically the nerve shows the ordinary degenerative changes of neuritis, with atrophy of its end organs.

SYMPTOMS

The cochlear branch is the more vulnerable of the two. Consequently, the cochlear symptoms are the first, usually, to appear, and the last to clear up. Not only in the ordinary disease process, but in similar conditions caused by pressure, such as eighth nerve symptoms produced by intracranial pressure, the cochlear branch is first involved. So, too, the rule holds in drug toxemias when the cochlear usually is alone involved, and in tumors of the acoustic, tinnitus and impaired hearing show themselves before the vestibular symptoms come on. The disease may limit itself to the cochlear branch, in which event the patient escapes the much more distressing series of vestibular symptoms. The disease may affect the cochlear branch on one side, and the cochlear with vestibular branch on the other side. All possible variations are seen in the involvement and escape of the four branches of the two nerves, and in the time intervals between the onset in each branch. That is to say, between one branch being involved, and the disease limiting itself to this one, and all four branches becoming involved, we have cases showing the greatest variation, both in extent of involvement and in the intervals between the onset of each set of symptoms.

Tinnitus is the first symptom of affection of the cochlear branch to attract the patient's attention. It is abrupt in onset, and usually severe. It is greatest in the beginning of the disease, and grows less as destruction of the nerve proceeds. It is also constant, and not dependent on the pulse or position of the head. It is followed by loss of hearing, which also shows a wide variation in its extent. Hearing loss may be only partial or it may be complete. It is characterized, however, by its sudden onset, and also by the variation from day to day. When the infiltration of the nerve is great, many of the fibers are incapacitated by pressure, and the patient hears badly; on other days the infiltration is absorbed, the pressure is reduced, and those fibers which are not degenerating recover their function, and the patient hears much better.

The shortness of bone conduction is a constant symptom. Even when the patient has fair hearing for conversation in the early stages of the nerve infiltration, the bone conduction will show a surprising shortness. Beck has noticed this in syphilitics who have no apparent ear symptoms; and he regards it as one of the signs of syphilis. The other functional tests in uncomplicated cases are those of nerve deafness. Weber goes to the side of the better ear; Rinné is positive; high pitched notes are badly heard; low pitched tones are, relatively to high, better heard.

The vestibular symptoms are much more distressing to the patient, and the alarm they cause him drive him at once into the physician's hands. He is very apt, however, when the cochlear branch is only slightly involved, not to associate them with his ear, and to seek aid from the general practitioner. Dizziness is of the labyrinthine type which causes the subjective sensation of the floor or ceiling revolving around the patient, and objects which he looks at, moving. It is accompanied in severe attacks by vomiting, or at least by nausea, pallor, and, sometimes, perspiration. Spontaneous nystagmus is present, and is of the vestibular type, that is, rotary, combined with horizontal. The nystagmus is very apt to change its direction. When

the patient looks to the right it may be to the right, and when he looks to the left it may change to the left. The gait suffers in proportion to the dizziness.

At the height of the attack the patient staggers to keep his balance, and even after the dizziness has become comparatively quiescent the patient suffers from a sense of insecurity in turning sharply around, or in walking in the dark. The attacks of dizziness come at intervals. Unlike inflammations of the labyrinth, in which the first attack is always the most severe, and from this climax the dizziness and corresponding vestibular symptoms taper off gradually in their severity, neuritis is apt to have one or two mild attacks preceding severe ones. These symptoms in neuritis come in the form of attacks lasting usually for two or three days with intermissions in which the patient may be fairly comfortable. The Romberg sign is present at the height of the attack, and gradually diminishes as the other symptoms subside. The falling reaction follows the direction, as a rule, of the slow component of the nystagmus, in twisting the patient's head over each shoulder in the Romberg position. The spontaneous pointing error will vary with the nystagmus during the acute attack, but the error becomes less and less, and pointing is usually normal within a few days. The caloric reaction is usually lost during the stage when the vestibular nerve is thrown out of function, and so too, the turning reaction, as a rule, shows lack of irritability on the affected side; but it is almost characteristic of neuritis that the caloric reaction and the turning reaction show great variations. As a rule the turning reaction is first lost, followed by the caloric, but cases show variation in having one positive and the other negative. Again with all symptoms pointing to great loss of function in the vestibular branch, the ear may show extreme irritability to the caloric reaction. The labyrinth may be so irritable that in rare cases a positive fistula test may be obtained with, of course, the drum intact. Ruttin's double sided caloric irrigation shows one side more irritable than the other, but not necessarily the normal side if the disease is unilateral. The variation between the findings in the turning reaction and the caloric reaction is one of the salient features of neuritis. The vestibular branch is more likely to recover than the cochlear, and it is the one in which signs of recovery are first manifested.

As cases have been reported of destruction of the labyrinth without symptoms in inflammatory conditions, so too Beck regards it probable that in rare instances destruction of the nerve may proceed without manifest symptoms.

The drum, as a rule, presents nothing abnormal in appearance, but occasionally a case is seen in which herpes of the drum is present. The serum may be clear or blood tinged. Probably the majority of the cases run their course without subjective sensations in the ear, but some cases are seen in which there are alternate sensations of heat and cold in the concha, and the eye can perceive the blood injection present, and the touch actually shows a difference of temperature between the affected and unaffected sides. Other cases show a sense of formication in the feeling of ants crawling over the ear, or other curious subjective interpretations of sensations. It is probable that there is fifth-nerve involvement in these cases which present auricle sensations. The coaffection of other nerves is quite common in auditory neuritis. Of these the seventh is the most usual, and it manifests itself, as a rule, by facial paresis, rather than complete paralysis. The extrinsic eye muscles are next in frequency of involvement, and of course are recognized by squints, diplopia, etc. The fifth is not frequently, but is sometimes, affected, and shows itself in hyperesthesia, paresthesia and anesthesia in the areas of its distribution. When we have a series of nerves coincidentally affected we have the clinical picture of polyneuritis cerebralis of Frankl-Hochwart.

DIAGNOSIS

The diagnosis of neuritis is not difficult when uncomplicated by a purulent otitis media. The cochlear and vestibular symptoms coming suddenly in a patient with normal drums, and with the history of no previous ear trouble, together with the frequency with which other nerves are involved, render the diagnosis comparatively easy. When a chronic or an acute otitis media happens to coexist the difficulties are greatly increased because there is always a possibility that the Ménière symptoms may be due to a serous or a suppurative labyrinthitis. There are some cases in which the diagnosis is practically impossible, and there undoubtedly have been cases incorrectly diagnosed and operated on under these circumstances. Our main reliance in such cases must be placed on the time interval, which usually occurs in neuritis between the appearance of the cochlear and vestibular symptoms. In labyrinthitis the cochlear and vestibular symptoms appear together, whereas in neuritis the probabilities are that an interval separates the manifestations of each branch. If the facial nerve is affected in neuritis it is just as likely to precede the involvement of the eighth; in serous labyrinthitis it follows or is coincident with labyrinth symptoms.

As a rule in neuritis the turning reaction is first lost, followed by the caloric; whereas in serous labyrinthitis, if both are not negative, the caloric is lost first, and is followed by the turning. The labyrinthitis is usually accompanied by the symptoms of acute exacerbation of the middle-ear trouble, and these may be of assistance in drawing a correct conclusion. The diagnosis in this combination, however, is difficult, and should neuritis come on with symptoms from both branches at the same time in a patient with a running ear, a mistake in the diagnosis is not unlikely. Tumor of the acoustic nerve might easily be mistaken for neuritis. In this condition our main reliance must be placed on the choked disk which appears early and quite constantly in tumor of the acoustic, and which, if present, determines the diagnosis. Cases of basal fracture with hemorrhage into the labyrinth, have the history of the accident and period of unconsciousness, together with other signs of damage, such as bleeding from the ear or the presence of a hematoma. In hemorrhage into the labyrinth such as occurs in leukemia the other symptoms of the blood condition are present.

PROGNOSIS

The prognosis varies with the branch affected, and also with the freshness of the affection when it comes under treatment. The cochlear branch is the more vulnerable to attack, and the more susceptible to permanent damage. Consequently, it is well to be guarded in giving a prognosis as to the amount of recovery of hearing which will take place. The vestibular nerve recovers much more frequently, and even when

recovery does not take place in this branch, compensation sets in from the other labyrinth, and by the patient calling his other senses, such as vision, tactile, and muscular sense to his aid in maintaining his equilibrium. He does not suffer, consequently, the inconvenience eventually from the loss of his vestibular nerve that follows the loss of the cochlear. The prognosis in the syphilitic cases varies with the freshness of the case at the time it comes under treatment. The sooner treatment is instituted after the onset of the symptoms the better is the outlook for recovery. In those cases which are of long standing, even though antisyphilitic treatment was not used, improvement does not take place when it is instituted in that gratifying way which follows the fresh case. The prognosis in hereditary syphilis is not good. A few cases have been reported with improvement in hearing following active treatment, but the great majority report the condition unchanged.

TREATMENT

Inasmuch as the great majority of the cases are due to syphilis the treatment consists of antileutic measures; and this brings us to the great question which has agitated the profession in the last three or four years, whether salvarsan is not more dangerous as a causative factor in producing the neuritis than as a curative agent for its repair. Several years ago Finger drew the attention of the profession to the great increase in the number of cases of neuritis of the eighth nerve since the introduction of salvarsan as a remedy for syphilis. Oskar Beck followed him with a number of cases which he reported as probably due directly to the salvarsan, and since then the literature has been rich with case reports and conclusions both pro and con on this mooted point. Alexander also came forward, and drew attention to the greatly increased number of cases in his clinic since the salvarsan era began. Beck's chief points were: the increased number of cases seen in the early stages of syphilis, the fact that after the injections of arsacetin (605) on mice the animals developed labyrinthine symptoms, and sections of their eighth nerve showed degenerative changes. He afterward made the same injection experiments with salvarsan, and reported the same degenerative changes in the nerve. He thought also that salvarsan had a selective affinity for the vestibular nerve, for while reports of previously isolated affections of the vestibular nerve were extremely rare in the literature he found ten cases in the Vienna clinic following the use of salvarsan.

These points, together with the fact that arsenic toxemia had been known to produce neuritis in various nerves, together with the history of atoxyl having produced many cases of optic neuritis, led him to the conclusion that salvarsan was probably a cause in itself in producing neuritis, and he laid down the rule that it should only be given in cases in which the patient had perfectly normal ears, or at the most an affection which was purely limited to the middle ear, but that it was contraindicated in any case of inner-ear trouble, such as otosclerosis, boiler-maker's ear, etc. Ehrlich then made a series of experiments on animals by injecting salvarsan, and making, sometime afterward, microscopic sections of the nerves, and he reported that he found no bad results, and that his sections showed no changes, whatever. We have, here, two sets of experiments with differing results, but the point is well brought up that such experiments are not conclusive in drawing conclusions as to the effect of salvarsan on man.

Ehrlich explained the cases following salvarsan, in the following manner, and described them as "neurorecidives." His explanation is that salvarsan rapidly sterilizes the body by destroying the spirochetes, excepting in the nerves lying in bony canals, the blood supply of which is very scanty. The spirochetes remaining in these nerves multiply rapidly, produce a local swelling, a consequent choking of the nerve, and in this way produce the nerve symptoms. Nichols augments this theory by pointing out that the rapid destruction of the spirochetes prevents the natural resistance bodies being further formed in the system, and that, consequently, the spirochetes which remain in the nerves proliferate and multiply with unopposed rapidity. The theory of Ehrlich has been pretty well accepted by the profession. In addition to this, Assmann, Dreyfus and others have pointed out that in nearly all cases of neurorecidives when the cerebrospinal fluid is examined, many cases show the presence of luetic meningitis, as shown by a positive Nonne-Apelt reaction, increased cells, increased globulin and a positive Wassermann reaction. This meningitis is latent, producing no meningeal symptoms except headache, but, in the opinion of Wechselmann, Assmann, Haike, Frey and others, it may furnish an explanation for the affection of the basal cranial nerves so often seen. Ehrlich's explanation, while acquitting salvarsan of being the direct cause of neuritis, is corroboratory of the increased number of cases since its introduction. That the cases have been increased has been combated with the explanation that our means of diagnosis of this condition is of recent development, and that, formerly, cases occurring were unrecognized. The labyrinth symptoms not being well understood caused a different explanation to be given by both the practitioners and the specialists into whose hands the cases fell. Otto Mayer searched the records of the Gratz clinic when it was under Haberman, and found sixty-five cases of acoustic paralysis, which commenced in the secondary stages of lues, so that he discredited the statement that neuritis in the early stages of syphilis had increased since the employment of salvarsan. Frey also found some cases, quoted in the literature, and Kreibich and a number of observers reported cases in the early stages of syphilis. Benario, in order to show that neuritis is not due to salvarsan, collected a series of 210 cases of general neuritis following the use of salvarsan, and 121 following mercury. Of the 210 cases, 79 were of the acoustic nerve, and of the 121, 46 were of the acoustic. From this he drew the conclusion that neuritis of the auditory nerve was not more frequent after salvarsan than after mercury. Of the 79 cases, both branches were affected in 33 cases, the cochlearis, alone, was affected in 23, the vestibularis, alone, in 6 cases, and the eighth nerve, combined with other cranial nerves, in 17 cases. Finger attacked this table on the ground that the number of cases treated with mercury which produced 121 neurorecidives was unknown, and, consequently, the table was valueless as showing the relative frequency of nerve lesions under the two systems of treatment.

Gerber reviews the whole subject, and divides the matter into three questions: first, How many bad results were due to early errors in the administration of salvarsan? second, What results are to be attrib-

uted to salvarsan and neosalvarsan? and, third, How many were neurorecidives, the condition disappearing under further treatment? We know that mistakes were made in giving salvarsan, that the intravenous method is less dangerous than the intramuscular, that the remedy must be fresh, and unexposed to the air; that mistakes were made in the water; and that too large doses of neosalvarsan at first were given. But even with such mistakes it is difficult to attribute the cases as clearly being due to the toxic effects of the remedy administered. Gerber compares the small group of cases which have been reported by Urbanschitch, Beck, Benario, Muller and others, where within a few hours or a day, after the injection of salvarsan, eighth nerve symptoms appeared, and lasted only a brief time, as analogous to the Herxheimer reaction in the skin, and differing in this way from the true neurorecidives which do not appear for from six to nine weeks after the injection.

Stepanoff, in order to satisfy himself as to whether salvarsan was injurious to the nerve, made 100 functional examinations of 33 cases in the secondary stages of syphilis treated with salvarsan and mercury. He found the vestibularis nerve usually normal, but sometimes showing decreased reaction. The cochlearis usually showed improvement after treatment. Denker also made 100 functional examinations of 22 patients, making the first examination before the injection of salvarsan, the second four or five days after and the rest extending over a period of from one to four months. His conclusion was that not the slightest harm was done to the nerve by salvarsan. Probably the strongest argument in favor of salvarsan is that 121 cases of neuritis following mercury treatment were treated with salvarsan, and of these 39 were cured, and 29 were improved. And stronger still are the cases reported when a neurorecidive followed the use of salvarsan, but on successive injections of the remedy cleared up. These results seem impossible if salvarsan had a selective action in itself in producing auditory neuritis.

It is probable that the conclusion arrived at by Haike and Wechselmann is correct, that salvarsan does not directly produce neuritis, but that indirectly the number of cases have been increased by the production of neurorecidives.

The treatment of neuritis when the syphilitic etiology is clear comes down, consequently, to the treatment of the syphilis, and the preponderance of evidence seems to show that salvarsan and neosalvarsan are the best remedies. They should be given in repeated doses, two weeks or a month apart, and combined with mercury in the intervals. Knick, Zaloziecki, Werther, Botey, Germanski and a great many others report good results in the earlier stages. In the long-standing cases hope should not be abandoned until repeated injections have been tried. Krumbein reports one case which showed no improvement until a year after treatment, at which time considerable improvement took place, and sufficient other reports are at hand to allow us to indulge in the hope of at least obtaining considerable improvement, if not a cure. When lues cannot be shown, we must endeavor to ascertain the cause of the toxemia, and treat it. When no cause can be definitely ascribed we must treat the case on the principle of a toxemia, and use all the elimination channels to combat it. In hereditary syphilis great improvement is not to be expected, although such cases have been reported. Seibenmann had some success in five cases, the promptest results coming in the freshest cases. Wanner, Leidler, Urbanschitsch and Beck all report cases with results, which, while not brilliant, render the salvarsan treatment worthy of trial.

1018 Shreve Building.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. WILLCUTT, HASTINGS AND WINTERMUTE

DR. J. HOLINGER, Chicago: The subject of functional tests of the ears has interested me ever since 1892. There was a great deal of mistrust against these tests, especially the tuning fork tests, at first, but the clear diagnoses as we heard them today and as they appear more and more, show that the criticisms that were enunciated at first were unfounded. Dr. Willcutt told us about the appearance of hard hearing soon after the appearance of the primary lesion of syphilis. This is new and important. In the later stages we expect to find all kinds of nervous symptoms. A great deal of work is still to be done. The work on this subject so far has produced many surprises. In some cases, especially during the early stages, we see wonderful results; in others we meet with an absolute lack of all response to treatment. We must study the reasons for the wonderful improvement in some cases, and the complete loss of hearing under careful, regular, systematic treatment in others. If you are optimistic in your prognosis you will meet with severe setbacks. Especially do I think we must be careful in cases of congenital syphilis. There we see patients toward the end of adolescence—say 16 to 20 years—where apparently slight hard-hearing which can be differentiated from otosclerosis begins with or without vestibular symptoms. At first specific treatment seems to do very nicely, but later on, after two or three or four months, you might have very surprising disappointments. It is my experience that in congenital syphilis we have to be very guarded in our prognosis. Even the results Dr. Hastings has shown I would not take as final. Wait and see whether in four or five years these improvements will keep up. I am sorry to say that, but I am speaking from experiences which have taught me this lesson.

DR. FRANCIS P. EMERSON, Boston: The small number of cases which I have observed—some eight or ten—causes me to hesitate to make any general deductions. The observations which have been made by Dr. Willcutt and others are of great practical use to us in cases which have failed to respond to treatment for chronic deafness, and particularly those cases in which we have no systemic evidence of syphilis being present. The cases I refer to particularly are those in which there is no physical evidence of syphilis and in which we are unable to get a history of syphilis, and yet we have a marked loss of hearing and our usual treatment does no good. Those cases which I reported a year ago in Philadelphia came under observation from the fact that in the clinic we had a large number of what we call "hospitalized" cases, namely, cases which were reporting constantly for treatment and not getting any better, and in starting to examine these patients systematically, that is, having a Wassermann made of every one and getting a careful history of every case, we found that in the hearing tests in those cases in which the Wassermann was positive, there was a surprising similarity in the formula. That is, there was a history of deafness over some little time, and yet the low notes were normal, and while the upper register was cut down to 1/25 or 1/35, making their hearing decidedly impaired, they presented a positive Rinne. There might be a lowering, as Dr. Willcutt says, both of air conduction and bone conduction, but the relation is still positive. The important diagnostic point is the lowering of bone conduction.

These cases are important, because a great many times in examining the nose and throat you find evidence of trouble in the nasopharynx that you might take as the

cause of their deafness, with other characteristic changes in the membrana tympani, so that the findings which Dr. Willcutt has brought out are of exceeding importance in arriving at a right diagnosis.

DR. GEORGE W. MACKENZIE, Philadelphia: Dr. Willcutt mentioned several authorities who found the Rinne negative in syphilis while others found the Rinne positive. I had hoped that perhaps he might explain why there should be such a variance in their findings. In a unilateral case of pure internal ear condition, we note in the milder grades the Rinne positive, but as the deafness increases the positive character gradually diminishes until it becomes plus-minus, and eventually with absolute deafness we have a negative Rinne. The reason for the negative Rinne is that the bone conduction is transferred from the other side. It is possible that some of these authors may have examined cases more or less unilateral and of moderate degree, while the others examined cases more pronounced. Where syphilis exists it more often affects both ears than a single ear, although I have in mind cases in which but one ear was affected. In cases in which both sides are involved the positive character of the Rinne is accentuated. Dr. Willcutt did explain that in cases in which there is a mixed condition, namely, with secondary middle ear trouble, we find the Rinne reversed. I think one of the authors he quoted said the bone conduction was shortened out of proportion to air conduction. Such a condition is impossible, for there is no condition in which we can find the bone conduction shortened more than the air. The air conduction must shorten in proportion to the bone conduction. His findings in regard to the acoustic apparatus and the vestibular apparatus are in accord with my own experience. In going through a deaf mute institution I had an opportunity to examine quite a number, and found the acoustic apparatus suffers more than the vestibular in all varieties of internal ear trouble. With treatment the vestibular apparatus may be benefited more than the acoustic. The reason is that the acoustic is phylogenetically the younger, therefore more vulnerable.

Dr. Hastings referred to absence of nystagmus by turning. If the vestibular apparatus on both sides is destroyed it would eliminate nystagmus by turning, but not so in a unilateral lesion.

The fistula sign is not an absolute indication of fistula of the labyrinth. Alexander and Lasalle report several cases, some of them quite normal, in which the fistula symptom was positive. In trying to determine whether the lesion is in the internal ear or the nerve, I would suggest that you try the galvanic test. In the internal ear condition with the nerve intact you get a reaction from the affected side with the cathode, provided you use sufficient current. In the nerve lesions, no matter what strength of current is used, for instance 20 milliamperes, you will get no reaction with the cathode.

DR. D. HAROLD WALKER, Boston: I think it is well to recognize that toxemias other than that of syphilis exist, such as alcohol, tobacco and, particularly, constipation. Before giving salvarsan, it seems necessary to institute a prolonged treatment by mercury, then salvarsan, until there is no further improvement in hearing. I would like to speak of a case which illustrates this point. A young girl with no history of syphilis became deaf suddenly in both ears; she could hear nothing, not even by placing her ear against a piano. She was treated by a local physician, pilocarpin and iodids being given. She was admitted to the eye and ear infirmary. After trying to exclude everything else, it was thought the condition might be due to syphilis. The Wassermann reaction was negative in both the blood and the cerebrospinal fluid. She was given inunctions of mercurial ointment for about three months, with no improvement, and as a last resort salvarsan was given. After the first dose the patient could hear noises and later the spoken voice. After the fourth treatment she heard a whisper several feet distant. It is probable that the mercury set free the spirochete, giving the salvarsan a better chance to attack.

DR. H. B. GRAHAM, San Francisco: I want to commend Dr. Hastings' paper in that he has been so accurate in reporting the details of his case. There is nothing that is quite as confusing or quite as disconcerting in a hunt of the literature as to find that a man had "a nystagmus." If one does not know any more than that it is not worth much. I think this matter of detail should apply to our future work in regard to syphilis. We must correlate our findings in these cases, because we must follow the history of syphilis in the future from a different standpoint. We have records of cases in the primary or the secondary stage, or inherited syphilis, all producing different symptoms. In the inherited cases are we dealing with the spirochete or is there such a thing as one inherited case containing a spirochete and another case no spirochete? Is it the toxin introduced into the body that is producing the area of infection? All of these things must be gone into as distinct entities. In congenital syphilis we undoubtedly have a shortened bone conduction. What is it due to? I do not think we are able to tell. If we have a family with a shortened bone conduction and without any other signs of syphilis except in one member of the family, I think we have a right to say that there must be some toxemia in other members of the family that is producing this shortened bone conduction. I have such a family. Four children have no signs of syphilis excepting this shortened bone conduction. A fifth child had epilepsy, which has entirely disappeared after salvarsan treatment. This one child has had a number of signs of inherited syphilis. The presence of shortened bone conduction is not indicative of course of syphilis in all cases, and it becomes very confusing when we are attempting to make a diagnosis of intracranial pressure. Whether intracranial pressure produces in all cases shortened bone conduction, and whether intracranial pressure is present in these syphilis cases, I do not know; but in tumors of the brain there is no shortened bone conduction, and it has misled a number of us in our diagnosis of intracranial conditions, because we were confusing these things with syphilis and trying to prevent an operation when there was an intracranial tumor present.

I want to call your attention to one of the statements of Dr. Wintermute which is of very great value, and that was the disappearance of the adequate function of the nerve in lues before the inadequate function disappears. The adequate function of the vestibular branch of the eighth nerve is a response to a turning motion of the body. The inadequate functions are responses to the galvanic current and to heat and cold. In a slow degenerative process the turning function disappears first.

DR. CULLEN F. WELTY, San Francisco: Shortened bone conduction leads many ways. I have observed two cases of syphilis with shortened bone conduction. How much shortened the bone conduction may have been prior to infection I am not able to say; but I think in studying these cases, our histories alone are conflicting until we have the findings prior to this trouble. In many cases we find shortened bone conduction without syphilis. In many cases of acute infectious diseases we have a shortened bone conduction without a record. There is some sort of infection that takes place during that disease.

The differentiation between nerve deafness and neuritis of the cochlear branch is very hard for me to make. As for Dr. MacKenzie, I have not used his mode of differentiation, and if that is accurate, I think it is the only reliable one that we can employ at present in the differentiation of these two conditions. I had a case similar to that of Dr. Hastings', of hereditary lues with acute exacerbation of the ear symptoms; that is, intense vertigo, tinnitus and nausea; the patient fell on the street. When I saw her several days following, I had to shout in an ear trumpet to make her hear. There was no bone conduction. Large doses of salvarsan were given. Hearing returned for ordinary conversation, but she still had some slight vertigo and tinnitus. After the second dose in a week, the vertigo and tinnitus disappeared. My instructions to the patient were to have salvarsan as soon as she noticed the slightest bit

of associated vertigo and tinnitus. She has had three additional injections and is now doing clerical work. She had marked interstitial keratitis.

I can recall another interesting case of a nurse at the city and county hospital with a diagnosis of acute Ménière's disease—intense vertigo, tinnitus, nausea and vomiting for several days. I saw her one week following, when there was decidedly shortened bone conduction on one side. In the course of four weeks she had a similar attack and there was approximately the same shortening of the bone conduction on the opposite side. These attacks continued for about three months, when she became totally deaf. This was some nine years ago. At that time, I called it acute Ménière's disease. She did not have a tumor, as she is still living and all the symptoms have subsided.

DR. H. W. LOEB, St. Louis: I would like to add a word with reference to the effect of salvarsan on the internal ear. Early in the use of salvarsan a patient was referred to me with this history: Several weeks before he had an extragenital chancre which had been operated on. His surgeon made a smear and distinct spirochetes were discovered and the chancre excised; he had then given him large doses of salvarsan. Ten days later the young man was taken with vomiting and spontaneous nystagmus, paralysis of the right side with complete deafness on the left side. He had been in that condition for three or four days when he was referred to me. I found the hearing tests indicated absolute loss of hearing on the left side, and I found spontaneous nystagmus leading toward the right side. The pointing test was very clear indeed, being toward the affected side. He was under my observation for three years, during which time the spontaneous nystagmus continued, to my surprise and much against my prognosis. This has disappeared and he now has a vestibule that responds to all the tests, but he has never recovered his hearing. I think that carries out the understanding that the cochlear part of the auditory nerve is far more vulnerable than the vestibule. Furthermore, he has never had a positive Wassermann and no other evidences of syphilis that could be made out. To me that is about as convincing as anything we get from postmortems.

DR. HARRY L. POLLOCK, Chicago: I have had recently an experience in which I found this shortened bone conduction in a case of acquired syphilis. I think the two papers should have been divided—congenital and acquired—because the prognosis is quite different. Dr. Willcutt stated that he did not know why the eighth nerve was most frequently involved. I have been under the impression that it was because the nerve passed through the narrow, bony canal, and the toxic effect of the syphilis caused a swelling in the canal, not only in the nerve but also in the sheath, and that this pressure caused the eighth nerve to be most frequently affected.

In regard to the Herxheimer reaction and deafness following large injections of salvarsan we know that in giving large doses of salvarsan we get edema of various parts of the body, and also get this in the eighth nerve. I have had quite a number of patients with syphilis in other parts of the head to whom I gave salvarsan, and following that a short time there was beginning nerve deafness, often as early as twenty-four hours following injection; but this gradually disappeared, or if it did not disappear it was followed within one week by another maximum dose of salvarsan, and then it cleared up entirely. The best results in these cases of syphilis of the ear I obtain by giving maximum doses, treating about once a week, giving as high as six or seven consecutive doses, and in all acquired cases I can say without exception the hearing was completely restored.

DR. WILLIAM R. MURRAY, Minneapolis: I would like to refer briefly to a case of syphilis that showed a very marked Herxheimer reaction following the administration of neosalvarsan. The patient, a woman aged 25, was entered at the outpatient department of the university clinic. She had secondary syphilis. The Wassermann was positive. There was no involvement of seventh or eighth cranial nerves, and no history of any ear trouble. Neosalvarsan was administered twice in doses of 0.6 gm. Ten weeks later the patient had a sudden attack of vertigo, nausea, and vomiting, followed by tinnitus and deafness in the left ear, the deafness becoming total in one week; tinnitus and deafness in the right ear, one week after involvement of the left, with total loss of hearing. Two weeks after the onset of deafness in the left ear, a left facial paralysis appeared and one week later a right facial paralysis also appeared. It was at this time that the patient came under my observation. Repeated Wassermanns were negative, both blood and spinal fluid. Otoscopic examination was negative. No nystagmus was present; caloric and turning reactions absent; no pointing errors; total loss of hearing. Treatment consisted in the administration of neosalvarsan, injections of salicylate of mercury, and potassium iodid. Neosalvarsan was given in small doses, from 0.3 to 0.6 gm., and the mercury and potassium iodid continued over a long period of time. The result of eight months' treatment was disappearance of tinnitus and facial paralysis. Deafness permanent.

DR. GEORGE H. WILLCUTT, San Francisco: I am disappointed that we did not have more of a discussion on the probable cause of this shortened bone conduction in syphilis. From the work I have done along this line, I favor the primary nerve infection or irritation theory rather than that of the increased intracranial pressure. Dr. Graham mentioned the relationship between increased intracranial pressure and bone conduction, in that in certain conditions of increased pressure we have a diminished or shortened bone conduction. This is very true and it is also very interesting to note that in a few cases of lues in which Beck did a lumbar puncture, there was a tendency for the shortened bone conduction to return to the normal. This may immediately follow the puncture, or it may come on gradually three or four hours following. In some cases of a shortening of fifteen or twenty seconds, it diminished to five or six seconds, a marked improvement but not to the normal. In a few days (three or four) it would be back to the twenty seconds again. Although this is in favor of Beck's theory, I do not believe it is satisfactory to explain the condition in the great majority of cases. In reply to Dr. MacKenzie, I think that only Dr. Kerrison reports the finding of a negative Rinne test in these cases. Urban, Politzer, Rhorer, and Emerson have reported that the majority of cases showed positive Rinne tests. I believe the difference in opinion is to be explained by the fact that the Rinne may change in these cases as just described by Dr. MacKenzie; but I have found the positive Rinne the rule. Dr. Pollock spoke of the relation of diminished hearing or deafness following the use of salvarsan and the Herxheimer reaction. Dr. Karl Theimer of Vienna considers the disturbances of hearing appearing within the first ten days after the use of salvarsan as analogous to the Herxheimer reaction and advocates the use of small doses of the specific to prevent this reaction occurring. I would like to report the case of an Austrian naval captain who had a severe primary infection and who received a large dose of salvarsan. Previous to the injection the otologic examination showed absolutely normal vestibular and cochlear reaction. Following the injection on the nineteenth day, complete bilateral deafness and loss of vestibular reaction were observed. After ten more doses the condition remained the same and when I last saw him, four months after the initial dose, he was in the same condition. This is one case that can probably be laid to the toxicity of salvarsan.

DR. HILL HASTINGS, Los Angeles: I think we are finding syphilis of the ear more often of late because we are looking for it. We all have had cases of syphilitic neuritis without knowing it; I know I have had. It is due to the use of the Wassermann test that we are able to find these cases of syphilis. Alexander says that in syphilis of the labyrinth there is always found a relatively great reduction of bone conduction. Alexander also says that in hereditary syphilis we get the fistula symptom more frequently than in acquired syphilis. Barany also mentions the fistula symptom as suspicious of syphilis of the labyrinth. Politzer says

hereditary lues is more common in females. His diagnosis is, (1) shortened bone conduction, (2) interstitial keratitis, and (3) the fact that both ears are involved. It is interesting to note that Politzer is the only man who reports a case within one week after the initial lesion (in 1878); since then all the reports have been of cases in the secondary stage, usually early, but not earlier than three or four weeks after the primary lesion. I have had a case recently, however, that occurred six years after the initial lesion, and the patient never knew he had syphilis. He was married, had a healthy child, and was astonished to know that he had syphilis. The Wassermann was 4-plus, and he was cured under mercurial injections.

Dr. Walker advises the use of salvarsan in the case I reported and I agree with him. In a general way I believe that the otologist is not the man to advise what the treatment should be. I think when he has made his diagnosis and told the patient what is wrong, that there his responsibility ends. It is wise for him to give advice, but I think the patient should be sent to a neurologist, and particularly to one who is doing syphilitic work, and let him give the treatment. It is not up to us to treat syphilis. This question of salvarsan therapy in disease of the eighth nerve is too new, the opinions too conflicting, for us to take any deliberate stand. In my patient the father objected to the use of salvarsan. Prof. Udo J. Wile recently advises small doses of neosalvarsan in syphilitic neuritis of the eighth nerve and reports good results from the cases sent him, with ear diagnosis made by Professor Canfield of the ear department.

DR. G. P. WINTERMUTE, San Francisco: Dr. MacKenzie's experiment with the turning nystagmus is very interesting, and possibly that may be the explanation of the well-known fact that in neuritis the nystagmus varies. I was much surprised to hear Dr. Hastings say that the majority of cases occur in the secondary stage of syphilis. I think Dr. Beck considers it rare in the secondary stage, and this was one of his points for considering salvarsan as the cause. Since this a number of cases in the secondary stage have been reported, but I do not think it is more prevalent in the secondary stage than later on.

MYOTONIA CONGENITA*

W. A. JONES, M.D.
MINNEAPOLIS

The various types of muscle-disease suggest to the general reader either a juggling of names or a confusion of ideas, and usually both. The literature, too, on the subject illustrates a diversity of opinion; but, out of the collection of reported cases, one may safely classify and differentiate clinical types.

Myotonia congenita, or Thomsen's disease, was first carefully described and recognized as a type by J. Thomsen, a Danish physician of Kappeln, Silesia. Thomsen was a sufferer from the disease, and came from a family in which it had existed for five generations, although the disease was described—at least a disease similar to myotonia congenita—by Charles Bell in 1832, but was not put in its proper category. Benedikt described a similar condition in 1864; von Leyden, in 1866; and in the same year Erb collected twenty-eight cases. Thomsen's paper, however, did not come out until 1876, and then was entitled "Tonic Cramps in the Voluntary Muscles in Consequence of an Inherited Psychical Disposition."[1]

Since 1876 the number of cases reported has rapidly multiplied; hence the confusion in the differentiation of these muscle-diseases.

In order briefly to summarize what is usually found under myotonia congenita, the following case will, perhaps, give an outline, although it presents no new features:

Mrs. E. S., aged 41, married twenty-one years ago, and the mother of six children, four of them dying within the first five months of disorders of metabolism. Two children are living and well. The parents of the patient are both living. The father is 62 years of age and in good health. The mother is 58, and very gross in appearance, probably suffering from obesity. She lives in a distant city, and consequently it is impossible to investigate her present condition; however, it is stated by the patient that the mother has suffered from a cramp-like attack in both hands for a great many years. This is the only history the patient has been able to give as to the possible heredity of her present trouble. A brother of the patient is living and well, and two sisters are living and in good health.

Mrs. S. has always been below par physically, and during childhood suffered from measles, mumps, chickenpox, and repeated attacks of tonsillitis. She has never had diphtheria or scarlet fever.

At 29 years of age she had an attack of smallpox.

Her menstrual life began at 14, and at 39 the menstrual periods became irregular and scanty in amount. She never sustained an injury of any sort, except at the age of 29. Following the attack of smallpox she was operated on for tubal pregnancy.

For the past twenty years she has had marked varicose veins, especially in the left leg; and these have caused her a great deal of inconvenience, and she has the usual stinging sensations which occur in a varicose condition.

The patient uses no drugs or alcohol, but has the tea habit, drinking from eight to twelve cups per day, and, in addition, two cups of coffee.

She has no evidence of a circulatory or a respiratory disease, and there is no active dyspnea, nor any palpitation. Her digestive apparatus is good, although her bowels are somewhat irregular and she complains of the usual distention of the abdomen. She is able to do her housework, although under some hardships; and for years she has attended to all her household duties and the care of her children.

The patient remembers that ever since she was a little child she has had trouble in moving her hands. She recalls that they would be in a definite position, and when she wanted to move them she found it impossible, for a few seconds, to make the required muscular effort.

During her young womanhood she had at times some difficulty in talking, and in other uses of her tongue. She says that her tongue would become spastic when she attempted to speak, or to move it in eating and swallowing. She described the sensation as a cramp in the tongue, similar to the cramp-like sensation in her hands. This condition has largely disappeared as regards the tongue; that is, she is able to speak clearly and distinctly, has no hesitancy in the movement of the tongue, nor has she any difficulty in swallowing. Occasionally, after shutting her jaws she finds it difficult to open them; the jaw feels as if it had been locked. These attacks, or tonic spasms of the jaw, never last more than a moment.

Six years ago, during her last pregnancy, when she was 36 years of age, the patient noticed that there was some difficulty in her feet and legs. The onset was very gradual; but it slowly and progressively grew worse. At the present time, if the patient attempts to go upstairs, she places one foot on the step, then the muscles become locked, and it is impossible for her to move her other foot and leg for several seconds. She also has difficulty in getting on the streetcar. With one foot on the lower step and the other foot either on the ground or in midair, she cannot get into the car until the muscles unlock. She also has difficulty in getting up from her chair.

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1. Osler: Modern Medicine, vi, 395.

Various attempts are followed by a spasm of the muscles, but she is finally able to arise.

When the patient is lying down, and has no weight on her feet and legs, she is able to move them in whichever direction she pleases, and the movements of the hands and arms also improve when she is lying down, although, occasionally, she has a spasm, and it is more or less difficult. Repeated efforts on her part, either to move her arms or legs, render each movement easier.

When the muscles are stimulated by electricity, either the faradic or the galvanic current, they promptly respond to the stimulation, but the relaxing movements require from four to eight seconds. The muscles of the forearm and the arm, as well as those of the leg, show this same electrical reaction, and the same hesitancy in their relaxing movements. This applies particularly to the movements of extension. There is some spasticity on passive movement; and her gait is more or less spastic until she is thoroughly under way. She has no contractions, and no muscular atrophy, except that the left lower face exhibits a little restriction of muscle movement, that is, it does not respond as promptly as the muscles of the right side. The movements of the upper face are plainly present, but weak. She has no atrophy of other face muscles, or of the sternomastoid or the vasti of the thighs.

The reflexes are obtained with some difficulty. They are feebly present in the biceps, are obtainable in the triceps, and are absent in the Achilles on both sides. The deep reflexes of the patellar group are obtained only on reinforcement. There is no clonus. She has flexion from plantar irritation, but there is no Babinski or other phenomena. Her grasp is rather feeble, as shown by the dynamometer; and she is able to force the instrument only up to point 7.

Her general condition is poor; she is pale and stringy looking, and has a tired, woe-begone expression. She has a small goiter, which involves the right and middle lobes. It is soft and a little boggy, but there are no other symptoms, although this condition has been present for about eight years.

The teeth are poor, and she has a decided pyorrhea alveolaris.

The bladder control is a little impaired, but not to any degree which renders her at all uncomfortable, perhaps no more than the average woman who has had six children.

The pupils are equal in size, and react to light and accommodation. There is no disturbance of vision or of any of the other cranial nerves.

A section of the muscle was removed from the upper arms, from the triceps area, and the following microscopic findings obtained, the description being from sections of muscle mounted and stained with hematoxylin and eosin:

The tissue seems to stain somewhat deeper than normal muscle, and in places shows marked affinity for the hematoxylin, but no degenerative changes can be distinguished. No distinct vacuolation was noted, although in places it might appear as such; but in all probability, it was due to separation of fibrillae or to an artefact.

By far the most striking features to be noted are the increase in size of muscle fibers and the presence of numerous nuclei, arranged, as it would seem, in fairly definite order.

The increase in size of the muscle fibers is very marked, varying from two to three times the normal size of muscle fibers. A lack of normal parallelism, while present, is but slight, especially when the size of the fiber is considered. The various muscle bundles do not appear as compact and firm as normally, but seem more loosely bound together, the individual fibrillae being more or less separated. Crossed striation, which has been reported to be absent in some cases, is certainly but feebly marked in places, while in others it seems to be absent.

The abundance of nuclei which stain a deep blue, and apparently do not partake in the general increase in size, is of interest. Just why they exist in such numbers and arrangement is not easily explained. From longitudinal sections it would be difficult to say whether the nuclei were in the muscle fiber or about it. From cross-section it would seem, however, that the nuclei arrange themselves about the muscle fiber and in or beneath the sarcolemma. These nuclei are usually in single rows, of varying length, and not confined to any portion or section but very numerous and all fibers show presence of these rows, as a rule but one row to a fiber, but this is not constant, as in places there would seem to be several rows. This may be due to the overlying sarcolemma sheath, or adjacent muscle fiber. These nuclei vary from six to thirty in a row, placed end to end.

A connective tissue change has been described; in the present case, except for a moderate looseness of separate muscle bundles, no change is to be noted.

The etiology of this case is rather obscure, except that it presents a very marked suggestion of heredity.

One cannot but consider that the exanthematous diseases that this patient went through in early childhood may have contributed to the early appearance of her symptoms. Then, too, she was a slight, frail, and rather poorly nourished type of woman. Also, the fact that four of her children died from nutritional disorders may tend to emphasize the theory of Dr. Ralph Pemberton,[2] who claims that in most of the cases of myotonia congenita there is a lessened creatinin output and a marked loss of calcium and nitrogen. This may or may not be an important factor, although in the majority of cases of myotonia congenita which come under observation, the patients are discovered to be suffering from the disease at about the twentieth year. Not uncommonly, however, children under the age of puberty are found to exhibit these awkward movements, which prove, under examination, to be a tonic spasm. It has been recorded by most observers that the majority of cases of myotonia congenita occur in men, and the lesser number in women. Just why, it is not easy to determine. The diagnosis of this case rests on the myotonic action of the muscles; that is, the response to stimulation and the slow relaxation which follows the voluntary contraction, the attitude of the patient, the character of the movements when an effort at standing and walking is made, and the use of the hands and arms are all a part of the myotonic action.

The prognosis in this case corresponds to other cases reported and depends on the severity or extent of the initial spasm. Not infrequently these people are able to carry on their work, as is the case with our patient. The disease, however, is essentially a chronic one, and progressive, with minor relapses or remissions.

The treatment is purely speculative. Various things have been done, but drugs have not proved advantageous; in fact, no permanent benefits have been realized from exercise, massage, or baths. The only thing that seems definite in the treatment of the disease is to keep the patient as active as possible; and, if there is a question of loss of lime salts, they can be introduced. These patients should, however, be kept from undue excitement or undue exposure to cold.

In connection with the report of this case it might not be out of place to refer to a somewhat similar condition which is known as Eulenberg's disease, or paramytonia congenita, an affection something like Thomsen's disease, in that the tonic spasm appears in certain voluntary muscles, more particularly in the face, so that the patient is unable, for fifteen minutes or longer, to open his eyes or to speak. The tonic spasm in Eulenberg's disease is usually caused by cold, but not by exertion as in Thomsen's disease.

2. Pemberton, Ralph: Jour. Med. Sc., cxli, 253.

Dysbasia angiosclerotica, or "intermittent limp," occasionally found in man, is found analogously in horses and is called "spring-halt." This condition is found in middle life and among gouty people or excessive smokers. On walking, the legs tire, and are heavy and painful with a cramp-like pain or limp. Persistent effort increases the difficulty, and it is associated with mottled, purple or red spots over the area of distribution of the posterior tibial or dorsalis pedis artery, due, supposedly, to a temporary spasm of the sclerotic vessel.

Tetany and myotonia congenita may be associated. Paolo Blau[3] records such a case. A young man of 21, a soldier, gave a history of symmetrical spasms of muscles of both extremities, the voluntary muscles particularly being involved. While marching he found it impossible to continue. The attacks came on after a long period of rest, and lasted from four to fifteen minutes. They began by a drawing pain in the neck, paresthesia, and a heaviness in the lower extremities. It was thought that these attacks were brought on by excitement. A sister and an uncle of the young man were similarly affected.

Myotonia congenita may also have associated with it von Graefe's sign.

Dr. J. P. Sedgwick[4] calls attention to von Graefe's sign in connection with several cases of myotonia congenita. He was able to collect histories of twenty-nine members of a family, thirteen of whom were affected with myotonia congenita, and sixteen were free. No atrophies were recorded, but all of the affected cases showed the von Graefe sign to a greater or less degree.

The most common muscle disorder with which Thomsen's disease may either be confused or associated is myotonia atrophica. This disorder or type is characterized by the rare association of muscular atrophy with slow relaxation of muscles after voluntary contraction. The weakness of the facial muscles, giving rise to the myopathic face, marked atrophy of the sternomastoids, the vasti of the thighs, and the dorsiflexors of the feet, are characteristic and salient symptoms. This name, "myotonia atrophica," was first suggested by Rossolimo, but others have described it as Thomsen's disease with muscular atrophy.[5]

Dr. Fred E. Batten,[6] in an article on "Myopathy," records a number of these cases and states that the condition of the muscles is the same as in other myopathic cases. He quotes Steinert as having found degeneration of the posterior columns in the lumbar cord, thus differentiating it from Thomsen's disease. Dr. Batten believes that these two diseases—that is, Thomsen's disease and myotonia atrophica—are simply variations in type or that they belong to the mixed types in which there may be intermediate forms or symptoms which serve as connecting links between types. It is interesting to note in connection with the term "myopathy" that there are four or five groups which are described under this common heading, which do not belong to the myotonia congenita group unless we accept the statement of Batten that they are all varieties of the same type of disease. For instance, in simple atrophic myopathy there is a lack of power and tone in all the muscles of the body, and to these Batten has given the name of "infantile." This disease is congenital or starts in early infancy and advances but slowly; and in some instances the patient is able to develop certain groups of muscles. It exhibits none of the typical myotonic muscular actions. In the next group comes pseudohypertrophic paralysis, in which there is weakness of certain groups of muscles with hypertrophy of some and wasting of others.

This disease is quite commonly known, and hardly merits further description, except that it may be combined with myotonia. Arthur F. Hertz[7] records a family in which the father and mother are normal, but the oldest son, aged 25, and the oldest daughter, aged 18, and the youngest son, aged 13, were all affected. A fourth son, who was drowned at the age of 18, was "also very slow" in his muscular movements. The generalized muscular hypertrophy is illustrated in each case. All showed myotonic action on voluntary contraction. Just another case to add to the confusion.

One form of myopathy is the juvenile form of progressive muscular atrophy, which is characterized by a weakness and wasting of the muscles about the shoulder girdle. Erb first described it, and probably it is a type of the living skeleton whom we formerly saw in the museums and other exhibitions. In this type of muscular atrophy there is no myotonic action.

The next form is the facio-scapulo-humeral form of Landouzy and Dejerine, which involves the face muscles, the shoulder, the pelvic girdle, and the muscles of the upper arm and thigh. The weakness of the face muscles is often present at birth; and here, too, this disease has none of the symptoms which characterize myotonia congenita. Then, too, there is distal myopathy, described by Sir William Gowers in 1902, and also recorded by Spiller, Dejerine, Thomas, and Campbell. The salient features of this type are a weakness and atrophy of the muscles below the elbow and knee, while the proximal muscles remain well developed.

Family periodic paralysis is another peculiar condition which might be confused with myotonia or myopathy. The paralysis, however, which is the characteristic feature, is very unique. If the patient is seen during the attack, the diagnosis is very simple. The paralysis, which may last from hours to days, is unaccompanied by any disturbance of sensation or disorders of consciousness, is irregular in its periods of occurrence, and is followed each time by a complete recovery.

Perhaps I may be pardoned if I refer, briefly, to another disorder or disease of the muscles which is commonly known as Oppenheim's disease, and described by him as myatonia congenita and by others as amyotonia. It has also been termed congenital hypotonia, or a myoplasia, and is known and referred to by Batten as the "infantile type of myopathy."

I simply introduce this as an excuse to call attention to the similarity in names rather than to discuss the condition, which is quite unlike a myotonia congenita. All of these terms include a condition in which there is an extreme flaccidity of the muscles, most marked at birth or early childhood, and associated with entire loss of the deep reflexes, and great weakness, but no absolute paralysis of any muscle. The limbs are most affected, and the face is almost

3. Blau, Paolo: Wien. klin. Wchnschr., March 18, 1915.
4. Sedgwick, J. P.: Am. Jour. Med. Sc., July, 1910, p. 80.
5. Batten, Fred E.: Brain, 1909, p. 87.
6. Batten, F. E., in Allbutt and Rolleston's System of Medicine, vii, 31.
7. Hertz, Arthur F.: Proc. Roy. Soc. Med., 1914, vii, 139.

always exempt. The muscles are small and soft, but there is no local wasting. The limbs are so flexible that a child or infant may be lifted up by an arm or a leg; and the joints and muscles and trunk seem to hang down as if without any support whatever, and certainly without resistance. In these amyotonias contractures are prone to occur in time. The faradic excitability of the muscles is increased, and strong stimuli are borne without complaint. It is claimed there is a tendency to slow and progressive amelioration. Notwithstanding the difference in opinion as to the amyotonias and myopathies, they are evidently separable and distinct clinical types of disorder. In discussing the differences between these types of disease, Collier and Wilson[8] draw the following conclusions:

1. The myopathies are conspicuously family diseases, whereas no family tendency has been recorded in amyotonia.

2. Several types of myopathies often show family relationships, one with another, whereas no case of amyotonia has been recorded in a myopathic family.

3. A large majority of the cases of amyotonia are congenital, the conditions being obvious at birth.

4. In a minority of the cases of amyotonia it has appeared acutely, and has reached its most severe degree in a few days. In none of its several types is myopathy apparent at birth nor has it appeared acutely or reached its maximum in a few days.

5. Local muscular wasting, which is a marked feature of myopathy, is not present in amyotonia.

6. The course of myopathy is one of progressive increase in muscular weakness; that of amyotonia is one of progressive amelioration of the symptoms.

7. The return of the deep reflexes in amyotonia may occur after months or years, while in myopathies the deep reflexes remain absent.

8. So far no nerve trunk or spinal-cord lesions have been demonstrated in true amyotonia and it may be added that no nerve or cord lesions have been found in true myotonia congenita.

Pillsbury Building.

ABSTRACT OF DISCUSSION

DR. FRANK B. STARKEY, Philadelphia: This subject of myotonia and myopathy has interested me very much because it has been attributed by a great many to disturbance of the glands of internal secretion. So far as I know, there is nothing definite to demonstrate this, and from the standpoint of treatment I do not believe that this theory can be borne out. I have had occasion to treat quite a large number of these cases, and they did not seem to respond to treatment along the lines that usually prove effective in cases of disturbance of the glands of internal secretion.

DR. G. W. ROBINSON, Kansas City, Mo.: In his closing statement, I believe, Dr. Jones said that no central nerve lesion had been found in true myotonia. Previously, I understood him to say that Batten had found degeneration of the dorsal cord tracts. One interesting feature is this: we cannot diagnose these cases (myopathies or myelopathies) without the clinical history. Wilson says that there is no differentiating pathology which will enable us to make a diagnosis by examination of the muscles. Many theories have been advanced, but it occurs to me that we should consider the antagonism between the cerebellum and the cerebrum in relation to muscle tone. The cerebral cortex inhibits muscle tone, while the cerebellum accelerates it. Whatever the condition may be, I believe there is some difficulty in the origin or discharge of nerve impulses in the control of the muscle tone, as we have a muscle that contracts and will not relax readily. We have in myotonia an accelerated tone which means the overaction of the cerebellum or underaction of the pyramidal mechanism.

DR. FRANCIS X. DERCUM, Philadelphia: I would like to ask Dr. Jones whether the affection described by Dr. Rich of Ogden, Utah, about twenty-one years ago is not identical with that of Ehrenberg?

DR. W. A. JONES, Minneapolis: The reference which Dr. Dercum has just made to Dr. E. I. Rich's observations in Utah, I know nothing of, consequently I cannot adjust the dates as to whether Rich's observations antedated those of Dr. F. E. Batten. Dr. Robinson of Kansas City, Mo., evidently misunderstood the paragraph in my paper. I, quoting from Batten, he quoting some one else, said that myotonia atrophica had been found to be associated with some degeneration of the spinal cord, consequently it was not a true myotonia congenita. Perhaps after all Dr. Thomsen was quite right when he said the disease myotonia congenita was one in which the psychical influence was the predominating factor.

8. Collier and Wilson: Brain, May, 1908, p. 1.

OPERATION OF MASSACHUSETTS' LAWS FOR HOSPITAL OBSERVATION IN CASES OF ALLEGED MENTAL DISEASE AND DEFECT *

HENRY R. STEDMAN, M.D.
BOSTON

Hospital observation of the alleged insane and mentally defective is so little made use of in this country that a restatement of its advantages, based on an experience of ten years of its operation in Massachusetts, may be helpful in extending the practice, particularly as the field of its usefulness there has become widened during this period to an extent which prevails in no other state.

The advantages of hospital observation in criminal cases over the practice of occasional examinations at the jail or prison must be plain to all. It is not an uncommon experience with psychiatrists to find evidence insufficient under these conditions. I have reported[1] an instance of this in which the late Dr. Jelly and myself, after a number of examinations, were on the point of pronouncing the prisoner to be not insane and therefore responsible, when still another interview was decided on. Then for the first time his actual mental condition came to the surface in denunciatory explosions springing from marked delusions of persecution and conspiracy, establishing mental disease beyond question.

There can be no question that an opportunity for hospital examination in obscure cases, where the subject can be under day and night supervision, can be examined by a staff of resident physicians and must live under the eyes of nurses trained to observe and report the talk, conduct, peculiarities and habits of patients, should be of the greatest help in reaching prompt and accurate decisions. Such a proceeding would also save expense to the state and make retrials less frequent. Moreover, where the law requires that in all criminal cases in which the plea of insanity is raised, the person shall be subjected to a period of hospital observation, as in the state of Maine, it undoubtedly tends to lessen the number of cases in which insanity is resorted to as a defense. Still

* Read at the meeting of the American Neurological Association, May 7, 1915.

1. Stedman, H. R.: Proc. Am. Medico-Psychological Association, May, 1904.

further, the evidence of unprejudiced state medical officials is likely to have far more weight with juries than that of paid medical experts engaged with a view to *ex parte* testimony.

The classes of criminals most likely to be affected by such a law are, first, those who conceal their delusions. These persons are notoriously suspicious, and persistently refrain from unburdening themselves to the examiners, so that many long interviews may be needed to gain their confidence sufficiently to elicit their false beliefs. Persistent feigning can also be far more easily and quickly detected under hospital conditions and surroundings than in jail, owing chiefly to the difficulty which a prisoner experiences in keeping up the pretense of insanity uninterruptedly and consistently (as he must to be successful) where he is watched day and night by careful observers. Most malingering is, as all know, bungling and readily exposed; but it is only with the utmost difficulty that really adroit feigning can be detected by the expert in occasional visits to the jail. Others are notorious capital cases. Here hospital observation as an adjunct to expert examinations must be of advantage in silencing popular clamor lest the prisoner escape just punishment through what is termed the "insanity dodge." The delay involved also tempers public opinion, as does the evident intent of thorough investigation shown in a term of hospital supervision. Another and important point is the fact that the hygienic conditions, mental, moral and physical, of close confinement and seclusion in jail are apt to impair the mental condition of those who are insane, and to our knowledge in more than one case have undermined the general health of the patient.

Although hospital observation has been for many years in active operation in Maine and for shorter periods in New Hampshire and Vermont, it has applied in those states only to criminal cases of alleged mental disease or defect. In Massachusetts this was also the case for four or five years, but in 1905, when the revised laws relating to the insane went into effect, the practice was extended to noncriminals, and we now have three laws providing for such observation for different classes of cases. The special law, governing criminal cases only, provides that not only persons under indictment for any crime but those under complaint as well, who are at the time appointed for trial or sentence or at any time prior thereto found by the court to be in such mental condition that their commitment to a hospital for the insane is necessary for their proper care or observation pending the determination of their insanity, may be committed by the court to such a hospital under such limitations as it may order. The court may in its discretion employ one or more experts on mental disease, qualified as specifically provided, to examine the defendant, and a copy of the medical certificate and of the complaint or indictment must be delivered to the superintendent of the hospital. By this provision, the lower courts are given authority in their discretion to investigate the mental condition of persons who are brought before them, with the result that in numbers of minor cases, persons charged with crime or misdemeanor have been found by expert examination and hospital observation to be subjects of mental disease or defect, patients who formerly would have been dealt with simply as criminals.

Under the Maine statutes, when a person indicted for an offense or committed to jail on a criminal charge makes a plea of insanity, the justice of the court before which the case is to be tried may order him to be sent to one of the hospitals for the insane for observation and report by the superintendent of the hospital.

The Vermont observation law is similar and applies only to the alleged criminal insane. It authorizes persons indicted for offenses or committed to jail on a charge thereof whose plea is insanity to be ordered into the custody of the Vermont State Hospital for the Insane, to be there observed and detained until further order of the judge, so that the truth or falsity of such plea may be ascertained.[2]

By the New Hampshire law, also, when a person is indicted for any offense or committed to jail on a criminal charge to await the action of the grand jury, any justice of the court before whom he is tried may, on the plea of insanity, put such a person into the care and custody of the superintendent of the state hospital, to be detained and observed by him until further order of the court.

That the measure is growing in favor with lawyers and legislators is further evidenced by the enaction of a statute by the Virginia legislature at its last session (1914) providing that the trial judge may commit such an accused person to a state hospital for purposes of observation.

Still more encouraging is the incorporation of this provision in the bill to regulate expert testimony, presented by the Committee on Insanity and Criminal Responsibility of the American Institute of Criminal Law and Criminology, a committee composed of prominent leaders of the bar and of four members of this association. Section 3 of the report, which is a model for future bills for hospital observation in criminal cases, is as follows:

> Whenever in the trial of a criminal case the existence of mental disease on the part of the accused, either at the time of the trial, or at the time of the commission of the alleged wrongful act, becomes an issue in the case, the judge of the court before which the accused is to be tried or is being tried shall commit the accused to a state hospital for the insane, to be detained there for purposes of observation until further order of the court. The court shall direct the superintendent of the hospital to permit all the expert witnesses summoned in the case to have free access to the accused for purposes of observation. The court may also direct the chief physician of the hospital to prepare a report regarding the mental condition of the accused. This report may be introduced in evidence at the trial under the oath of said chief physician who may be cross-examined, regarding the report by counsel for both sides.[3]

Another strong point in favor of hospital observation for the alleged insane is the unanimous verdict of alienists and jurists in the states in which it has been adopted, that these laws have been found to be practical and thoroughly satisfactory in their operation.

Under the German law, persons who are suspected of being insane may be sent to one of the psychiatric clinics for observation. The chief of the clinic is required to render a report to the magistrate on or before some fixed date. The same law applies to criminals or persons charged with crime, but the period in the latter case may be extended if the chief of the clinic does not consider it to be sufficiently long.

The number of criminal cases affected by this law in Massachusetts is, to be sure, not large. In the past

2. Vermont Statutes, Acts of the Fifteenth Biennial Session.
3. Jour. Am. Institute Crim. Law and Criminology, January, 1913.

five years but thirty-two were admitted to the Bridgewater State Hospital (for criminals), and a much smaller number to the other hospitals. One reason for this is thought to be that frequently the mental condition of accused persons under complaint or indictment has not been recognized until after imprisonment, when they are regularly committed as insane and transferred to Bridgewater from penal institutions. The law, however, is being more generally availed of year by year in the lower courts for the not infrequent borderland and other cases in which mental disease or defect is suspected in persons under arrest. But though the number of such cases is small, they bulk largely in public importance, as they embrace many capital cases, and it is in them that hospital observation is of especial value.

Much has been said of the need of improving the character of medical expert testimony, and not a few bills have been drawn, only to fail of passage, with a view to securing properly qualified experts. By the practice of hospital observation, this requirement would seem to be met, as the opinions given would be those of physicians trained in and practicing psychiatry.

Simply the securing of accurate diagnosis in criminal cases, however, is a comparatively small part of the usefulness of the measure, for it is in noncriminal cases that it has been found to be of the greatest service. A separate law provides for this in Massachusetts, and reads as follows:

> If a person is found by two physicians qualified as provided in Section 32 to be in such mental condition that his commitment to a hospital for the insane is necessary for his proper care or observation, he may be committed by one of the judges mentioned in Section 29 to a state hospital for the insane or to the McLean Hospital, under such limitations as the judge may direct, pending the determination of his insanity.

From statistics kindly collected by Dr. A. W. Stearns, it appears that, during the past five years, 370 persons have been so committed — chiefly to the psychopathic hospital — for varying periods, the large majority remaining under observation for thirty days. Thirty, sixty or ninety days are the terms usually imposed by the court, although occasionally the time has been extended further, extension of time being usually readily granted by the court. Their progressive increase in number of years is striking, namely, 19, 47, 64, 83, 152. As to the disposition of the cases: on the expiration of the period of observation, 189, or a trifle over 50 per cent., were pronounced insane and regularly committed to state hospitals. With the exception of eight who died and a few remaining in the hospitals, the remainder were discharged to their homes outright. The available statistics relating to this group are unfortunately not uniform for the five-year period, so that their precise condition on discharge could not be ascertained, except that none of them could be legitimately certified as cases of actual mental disease needing hospital care.

As regards the type of cases under observation, one superintendent reports that those discharged were chiefly constitutionally inferior psychopaths, and this appears to obtain generally. These patients have mild psychotic episodes, readjust themselves, and return to the community. Alcoholics swell the number, and mild hebephrenics, incipient paretics, the senile, the hypomaniacal and the hysterical complete the list. The superintendents generally find the law very satisfactory for both the criminal and noncriminal. It is pronounced by them to be the fairest method of determining the mental status in most of the doubtful cases.

The committing judges without exception regard the laws as most advantageous. Hon. Robert Grant, judge of the probate court, to whom I am indebted for data on the subject, and his colleague, Hon Elijah George, who passed on most of these cases, make no question that this method of sending doubtful cases to a hospital for observation for a limited period in preference to outright commitment is finding favor with physicians and the public, and is already recognized as a valuable method of relief. The procedure, they believe, affords valuable protection to the public and those alleged to be insane, and is likely to be more and more adopted in such cases.

The law relating to the admission of patients to the psychopathic hospital at the University of Michigan embodies the only other bona fide observation law for noncriminal cases. It is practically the same as the Massachusetts statute except that it limits the observation to thirty-five days. Its operation is most satisfactory and is frequently taken advantage of. In borderland cases it especially impresses the patient, the examining physician and the court as being eminently fair.

Another provision, which to a limited extent acts as an observation measure, is the Temporary Care Act, as we call it. It prevails in one or another form in most states in which psychopathic hospitals or wards have been established. This, in brief, provides for the admission of the patient without a court order, and his detention at the option of the superintendent for ten days, within which time he must either be regularly committed or removed from the hospital, unless he makes application to remain as a voluntary patient. Under this law, together with the observation and emergency law, 1,016 persons in Massachusetts, according to the report of the State Board of Insanity, secured the benefits of treatment in our public or private hospitals for the insane during the year 1913 without the formality of a procedure before a judge, which would have been attended with delays, legal exaction, semipublicity and the stigma of having been pronounced insane, all of which were thus obviated, to the comfort and satisfaction of the patients and friends. It is not my purpose to dwell on the many advantages of such temporary care, but merely to point out that, simply as a measure of observation, the law is inadequate in many cases, chiefly because of the shortness of the time limit. Twenty-one per cent. of the patients admitted under the observation law in Massachusetts in 1914 were originally temporary care patients for whom the short period allowed had been found to be insufficient for ascertaining their precise mental condition, and they were committed under the observation law for further periods of thirty, sixty or ninety days. These laws provide the only means short of regular commitment of detaining patients who refuse to remain longer than ten days. It is possible, also that, in the hospitals in which large numbers of cases of temporary care are received, some have been hastily disposed of by outright discharge or regular commitment to a hospital as insane who would have been benefited by further observation, especially when we consider the difficulty of keeping track of the varying dates on which the ten-day limit expires in individual cases.

I have been unable on careful inquiry to find that the constitutionality of the two observation laws mentioned has ever been seriously questioned, nor did the passage of the acts encounter any opposition in Massachusetts. In New York, however, two attempts under the auspices of the New York Psychiatrical Society to bring a hospital observation bill before the legislature have been unavailing, the first because of the opinion of lawyers that such an act would certainly fail of passage on that ground, and the other because it was loosely drawn.

The temporary care act also has suffered no public criticism or individual opposition in Massachusetts, although the fact that neither a physician's certificate nor medical diagnosis of any kind is required by the act might well raise a question of its constitutionality. This is a striking proof of the need and value of such a provision.

CONCLUSIONS

1. Hospital observation is a measure of proved value in doubtful cases of mental disease and defect in both criminals and noncriminals, and is growing in favor.

2. It affords opportunity for constant observation and ample time for thorough examination under the best conditions by trained hospital psychiatrists.

3. It is of especial value in capital cases, in cases with concealed delusions and in the detection of malingerers.

4. It tends to make less frequent the plea of insanity as a defense for crime, and to lessen disrespect for expert medical opinion.

5. In many noncriminal cases it saves persons from hasty and ill-considered commitment as insane.

6. There appears to be every reason why the forty-three states which are without this valuable provision should adopt it, particularly as it has been long in successful operation in some form in six states and in Germany, and has the endorsement of our foremost jurists and alienists.

48 Beacon Street.

AN OPERATION FOR CONGENITAL EQUINOVARUS DEFORMITY

PRELIMINARY REPORT

FRANK R. OBER, M.D.
BOSTON

It has long been taught that there are three elements in every case of congenital equinovarus deformity: equinus, varus and inversion. If one expects to cure the deformity, one must secure their overcorrection.

After studying several hundred cases before and after several methods of treatment, and eight specimens in various stages of dissection, certain conclusions were drawn.

First, the equinus is due principally to a contracted Achilles tendon and a short posterior calcaneotibial ligament. Equinus chiefly recurs because the articular facets of the malleoli and the articular surface of the tibia are on the extreme posterior part of the articular surface of the astragalus, which is much narrower than the anterior portion of this surface. Consequently the mortise is narrowed, and when one attempts to overcorrect equinus, after division of the Achilles tendon, the astragalus does not slide back in the mortise as it should, but is tipped up anteriorly.

The varus is due to contraction of the posterior and anterior tibial tendons, an outward rotation of the anterior end of the astragalus and the os calcis, and to an adduction of the forefoot which gives a series of subluxations and dislocations of the mid-tarsal joint and the posterior tarsal joint. Dislocation is *chiefly maintained* by contracture of the *superior* and *inferior* calcaneoscaphoid ligaments (which are really portions of the deltoid ligament). The calcaneoscaphoid ligaments act as a longitudinal bow string.

The inversion of the whole foot is due to contraction of the two tibial tendons and of the deltoid ligament. This contracture maintains the os calcis in an inverted and a rotated position at the astragalocalcaneal joint, the sustentaculum tali being held nearer the internal malleolus *by the short vertical fibers of the deltoid* ligament than in a normal ankle.

Since March 6, 1915, ten children, ranging in ages from 3 to 13 years, have been operated on at the Boston Children's Hospital by the following method:

A fish-hook incision, 3 inches in length, is made about the internal malleolus. The incision begins 1½ inches above the malleolus, half way between the posterior border of the tibia and the Achilles tendon, a tourniquet having been previously applied. It is carried about one-half inch below the malleolus and swung anteriorly and a little upward over the depression which represents the situation of the subluxated scaphoid. It is carried through skin, fat and subcutaneous fascia, and the anterior flap is dissected well forward so that, in sewing up, no undue strain is brought to bear on the skin edges of the wound. This incision exposes the deep fascia over malleolus, the annular and deltoid ligaments.

A semilunar incision is now made, curved upward, three-quarters inch above the tip of the internal malleolus through all the structures to the bone, avoiding the posterior tibial tendon. This flap is dissected off the bone in a downward direction, and includes both layers of the deltoid ligament, giving an excellent ligamentous flap and a wide exposure of the tibiotarsal articulation. The superior calcaneoscaphoid ligament is divided transversely by simply continuing the curved incision toward the plantar surface of the foot. By means of a tenotome the portions of the deltoid and inferior calcaneoscaphoid ligaments, which are respectively attached to the posterior and anterior borders of the sustentaculum tali, are incised longitudinally to the bone. With a blunt dissector or an osteotome, these ligaments with periosteum are actually boned off of the inferior surface of the sustentaculum tali and well down on the internal surface of the os calcis. It is not often necessary to cut the posterior tibial tendon, and it is not necessary to cut the Achilles tendon except in older children. The plantar fascia may be divided if there is considerable cavus. The foot is now grasped, both by the forefoot and the heel, and is manipulated into an overcorrected position. The *os calcis everts easily*. The head of the astragalus and scaphoid rotate into normal position. Satisfactory overcorrection is obtained.

We must secure good eversion of the os calcis if we expect to relieve or cure clubfoot. If we desire to lengthen the Achilles tendon, it may be cut at this time. The deltoid ligament is sutured at either corner, low down on the malleolus, so that this important structure will be preserved intact. The foot should be so well overcorrected that it can be held in such a position with very slight effort. A sterile gauze dressing is applied which is covered by sterile sheet wadding. A plaster is applied from the toes to mid-thigh, maintaining the foot in the overcorrected position and the knee flexed to a right angle. A window is cut over the wound with a twofold idea: It relieves any subsequent pressure on the wound and allows the foot at this point to bulge into the wound, giving more correction.

Later a complete report of results will be made, with credit for points found to have been brought out by others, and a review of the recent literature.

Special Article

PRACTICAL PHARMACOLOGY*

(Continued from page 427)

XXXI

ANTHELMINTICS

Anthelmintics are agents that kill intestinal parasites or facilitate their expulsion with the aid of evacuants.

The ideal anthelmintic would kill or stupefy the parasites but would not be absorbed from the gastrointestinal tract of the host, nor would it irritate the stomach or the bowel more than enough to cause purgation. Unfortunately, the best of the anthelmintics at our disposal are far from being ideal, and all of them are capable of causing the death of the patient if used without care, while none of them is certain in its action on the parasites.

The round worm (*Ascaris lumbricoides*) and pinworm (*Oxyuris vermicularis*) are probably the most common of this type of parasite in the bowels of children, if we except the hookworm, which is very prevalent in certain parts of the country, while the tapeworm, including the *Taenia* and *Bothriocephalus latus* (or broad tapeworm) are found more commonly in adults than in children, but taeniae are occasionally reported as occurring in children and a case of *Taenia saginata* has been very recently reported as occurring in an infant.

Gross parasites of this nature can be guarded against more easily than the bacterial infections, and the more common sources of infection should be understood more generally than is the case.

The so-called head, which is of minute size, is the real tapeworm, all the remainder, the segments, consisting of generative buds containing matured sexual organs. These are constantly breaking off and passing out of the bowel, the ova being swallowed by other animals in which they develop in various organs. For example, the hog is commonly infested with *Taenia solium*, which becomes encysted, forming what is known as "measles," and when a person eats raw measly pork he becomes the host of a tapeworm, *Taenia solium*. It is probably the tapeworm most commonly found in this country. *Taenia saginata* may infest beef in the same way. *Bothriocephalus latus* is very much more common in Europe, but it is occasionally seen in this country.

The dog is commonly infested with intestinal parasites, which are sometimes present in large numbers. Other domestic and wild animals are similarly infested.

While the eating of raw meats, especially pork, is probably the commonest source of infestation, the possibility of having the hands contaminated by pets should be borne in mind.

All active cathartics tend to remove worms and other intestinal parasites in the evacuations, but while this may occasionally succeed in ridding one of the so-called head of the tapeworm, as a rule only a smaller or larger number of segments are thus gotten rid of and these segments are rapidly replaced.

As previously stated, none of the anthelmintics is either certain in its action or free from danger; hence every precaution should be taken to insure the most favorable conditions for the expulsion of the parasite when medication is undertaken.

Medication should be preceded by a diet calculated to weaken the parasite as much as possible without greatly weakening the patient. Meat and other proteins are withheld or given in small amounts while carbohydrates are given in abundance. It is said that sharp particles, such as seeds of strawberries, and pungent substances, such as mustard, tend to cause the parasite to loosen its hold; hence these may be utilized as a preliminary to active treatment.

Tapeworms are provided with suckers, hooks or serrated margins by which they attach themselves to the mucous membrane of the intestine, and the best that can be accomplished by anthelmintics, as a rule, is to stupefy the parasite or paralyze its musculature so that its hold on the intestinal mucous membrane is released, at which time it may be swept out in a copious watery evacuation.

The patient should fast for about twelve hours before taking a taeniafuge, such as aspidium or pelletierin, but a cup of coffee may be taken in the morning on arising, that is, shortly before the administration of the drug.

A laxative may be administered previously so as to insure the almost complete emptying of the intestine, but an entirely empty tract facilitates the absorption of the drug by the host.

The parasite is usually caused to loosen its hold within an hour or two after the administration of an effective dose of aspidium; hence the purgative is usually given either at the same time or shortly after the anthelmintic.

Aspidium

Our knowledge of the chemistry of aspidium is unsatisfactory, but there are several substances, including amorphous and crystalline filicic acid, on which the anthelmintic actions of the drug seem to depend. Whatever the nature of the active principles, they are present in the oleoresin, in which form aspidium is now commonly employed.

Under favorable conditions but little of the oleoresin (or its active constituents) is absorbed into the circulation in man, but when absorption does occur severe, and even fatal, poisoning may result.

Nausea and even slight vomiting are not infrequent consequences of therapeutic doses, and this may even prevent the desired action of the drug. With absorption and severe poisoning there are violent vomiting and purging with pain in the intestines, muscular weakness and convulsions, followed by stupor passing into coma. Castor oil is sometimes administered with aspidium or afterward in order to induce purgation, but there seems to be little doubt that, because of the readiness with which it dissolves the active principles of aspidium, it promotes absorption unless purgation is prompt.

It is stated that aspidium is less effective against taeniae than against *Bothriocephalus*. It is unfortunate that this point has not been determined with certainty, for aspidium is widely used for tapeworm regardless of the species infesting the patient.

Pelletierin Tannate

The bark of pomegranate root has long been used in the treatment of tapeworm, but it contains an abundance of tannin and this often gives rise to vomiting when an infusion is employed in the dose necessary to

* This is the thirty-first article of this series to appear in The Journal. These articles, which have been prepared by Dr. R. A. Hatcher and Mr. M. I. Wilbert, will be elaborated by additional material and will be issued in book form about September 15.

act as a taeniafuge — from 30 to 60 gm. (1 to 2 ounces) — hence the tannate or sulphate of the alkaloid, pelletierin, is now almost always used instead of the bark.

Pelletierin is sometimes absorbed from the gastrointestinal tract, causing stimulation of the central nervous system, and a veratrin-like action on the muscles. It seems probable that a similar action on the musculature of the tapeworm explains its efficiency as a taeniafuge. Poisonous doses of pelletierin cause dizziness and sometimes disturbance of vision in addition to the muscular weakness.

SANTONIN

Santonin is probably the most effective anthelmintic available for the expulsion of the round worms of childhood. According to von Schroeder santonin does not kill the worm but renders the intestinal contents unpleasant, causing the parasite to seek the large bowel, from which it is expelled by the cathartic that is used in the treatment.

Sodium santoninate is soluble and this is probably absorbed into the circulation of the patient more rapidly than the insoluble santonin; hence the coarsely powdered crystals of santonin are generally directed to be used.

Santonin is always absorbed to some extent and gives the urine a deeper yellow or red color if it be alkaline. Poisoning rarely follows the administration of suitable doses of santonin, but frequently objects appear violet colored and later yellow, after its administration, and convulsions may result from poisonous doses.

Oil of chenopodium or oil of American wormseed has long been used in the treatment of round worms of children, and of late it has attracted attention in the treatment of hookworm. Two investigators reported that they used it in the treatment of nearly 1,500 cases of hookworm with more frequent success than was attained with thymol or other means.

They administered three doses, each containing 16 drops of oil of chenopodium, at intervals of two hours, and after another interval of two hours they administered a tablespoonful of castor oil to which they added a large dose of chloroform.

The oil of chenopodium does not kill the parasite but narcotizes it and it must be expelled by means of a cathartic, castor oil being employed frequently.

Several cases of severe or fatal poisoning by oil of chenopodium have been recorded and the drug should be used with caution.

At the present time the supply of thymol is said to be extremely limited, and there would appear to be no reason why the generally safer oil of chenopodium should not be used in its place.

The anthelmintic actions of thymol have been considered elsewhere.

The pinworm, or threadworm (*Oxyuris vermicularis*), is a very small parasite that inhabits the lower parts of the intestine in great numbers. It does not attach itself to the intestinal mucous membrane and may be dislodged from the bowel by cathartics and enemas.

Bastedo mentions the following as being used for irrigating the colon to remove the pinworm: infusion of quassia; lime water; quinin bisulphate 1:2,000; a solution of tannin or alum 2 gm. (30 grains) to 500 c.c. (1 pint) of water; or 15 c.c. (½ ounce) of oil of turpentine to 1 liter (1 quart) of soap suds.

He states that the *Taenia nana* is often mistaken for pinworm and one of the dwarf tapeworms is said to be the commonest of the tapeworms of childhood.

DOSAGE

The average dose of oleoresin of aspidium is given as 2 c.c. (30 minims), but larger amounts are frequently used.

The average dose of pelletierin tannate is 0.25 gm. (4 grains) and it is stated in "Useful Drugs" that not more than 0.3 gm. (5 grains) should be given at once, as that amount has caused paralysis, but Meyer and Gottlieb state that doses of 0.3 to 0.4 gm. (5 to 6 grains) of the sulphate or the tannate usually act efficiently without causing severe symptoms of poisoning. These authors advise the administration of 0.5 to 1 gm. (8 to 15 grains) of tannin with the tannate or sulphate to insure that the alkaloid be maintained in the intestine in the form of the insoluble tannate.

It may be given preferably in the form of capsules after the usual preliminary attention to the diet and emptying of the intestinal tract, and it is best followed in two hours by a brisk cathartic, such as castor oil or magnesium sulphate.

The average dose of santonin is 0.065 gm. (1 grain). Since santonin does not kill or even severely injure the worm it is better practice to give the drug for several days. Lozenges, containing 0.03 gm. (½ grain) santonin may be given to a child morning and evening for three days; twice as much is used for an adult. The last dose is to be followed by a purgative such as calomel, or a laxative dose of calomel, 0.005 gm. (⅛ grain), may be administered with each dose of santonin.

The dose of oil of chenopodium is given as 0.2 c.c. (3 minims) in the pharmacopeia, but this appears to be rather too conservative. But it would be wise to avoid the use of large doses of chloroform after maximal doses of the oil, for chloroform, which is itself an active anthelmintic in large doses, is usually considered too poisonous for common use for this purpose.

MATERIA MEDICA

Of the preparations used as anthelmintics, the more popular are:

Oleoresina Aspidii. — Oleoresin of Aspidium, U. S. P., a semisolid dark green extract. On standing it usually deposits a granular crystalline substance which should be thoroughly mixed with the liquid portion before use.

Pelletierinae Tannas.—Pelletierin Tannate, U. S. P., a mixture of alkaloids, obtained from pomegranate, which occurs as a light, odorless amorphous powder that is only slightly soluble (1:235) in water, but soluble (1:12.5) in alcohol.

Santoninum.—Santonin, U. S. P., the inner anhydrid or lactone of santonic acid, a glucosid obtained from santonica. It occurs in colorless crystals that become yellow on exposure to light and air. Santonin is very insoluble (1:5,300) in water, but soluble (1:35) in alcohol.

Oleum Chenopodii.—Oil of Chenopodium, U. S. P., a limpid, yellowish liquid having a peculiar somewhat camphoraceous odor and a pungent, slightly bitter taste.

Thymol.—Thymol, U. S. P., a phenol occurring in various volatile oils and usually obtained from oil of ajowan. It is only very slightly soluble (1:1,100) in water but very soluble in alcohol.

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SATURDAY, AUGUST 14, 1915

LIGHT RADIATIONS AND PROTOPLASM

The newer knowledge in the field of physics has brought about a recognition of the fact that in addition to the visible electromagnetic waves, the invisible infra-red and the ultraviolet light waves also have indisputable chemical and biologic effects. To these are sometimes added the influence of what has fancifully been called Roentgen "light," as well as the "gamma light" from radioactive substances. Electromagnetic waves, as Bovie[1] has expressed it, have no effect on objects which are incapable of vibrating in resonance with them. The wave passes through the object, and the object is said to be transparent to the particular wave length in question; for example, rock salt is transparent to heat, to visible waves and to ultraviolet waves; ruby glass, to red light waves; paraffin wax, to hertzian waves; white fluorite, the most transparent substance known, to heat, to visible waves and to ultraviolet waves; thin deposits of metallic silver, to ultraviolet waves; thin aluminum plates, to Roentgen waves; and thin metals of all kinds, to gamma waves. No substance is known which is transparent to the entire electromagnetic spectrum.

Dr. Bovie[1] of the Cancer Commission of Harvard University has lately reminded us anew that the substances of which living organisms are composed are capable of resonant vibrations over a considerable range of vibration frequency, including the entire range of solar radiation. Protoplasm is capable of "detecting" and being modified in some degree by the electromagnetic manifestations constituting the radiant energy received from the sun. If we know far more about the physiologic effects of heat waves than of light on the tissues of the body, it is because experimental science has only of late become possessed of methods for investigating properly the radiations of shorter wave lengths and higher vibration frequency. Indeed, it is doubtless on this factor that the differences in the physiologic effects of hertzian, heat, light, Roentgen and gamma rays are dependent.

The physiologic effects of light must be the result of photochemical reactions. Inasmuch as only those electromagnetic waves which are absorbed are capable of bringing about physiologic changes, the study of the behavior of various tissues in this respect toward the light of various wave lengths becomes important. One of the important discoveries made by Finsen, says Bovie — a discovery which proved to be the key to his success in phototherapy — was that it is the blood in the skin which absorbs most of the ultraviolet light. Sunlight ultraviolet can penetrate blood-filled skin only a fraction of a millimeter. But if the skin is made anemic by the pressing out of the blood, bacteria can be killed by ultraviolet light which has passed through 4.25 millimeters of skin.

Practically no studies have been made on the physiologic effect of hertzian waves on the body, though they are known to be absorbed by the tissues. It is said that there is a marked increase in the photo-instability of many of the proteins and amino-acids in passing from the sunlight region of the ultraviolet to the regions of higher vibration frequencies which lie beyond. The so-called photodynamic effect of fluorescent substances has been discussed in THE JOURNAL.[2] If it is true that a large percentage of "sunlight" ultraviolet light can be absorbed in the blood stream and there bring about chemical changes, it may turn out that visible light can exert an effect on sensitized tissues as destructive as that of ultraviolet light and other radiations on normal tissues. The future is likely to see distinct advances made in this department of study involving the action of light on protoplasm.

1. Bovie, W. T.: The Action of Light on Protoplasm, Am. Jour. Trop. Dis. and Prev. Med., 1915, ii, 506.

HOW SHALL MILK BE RATED?

The quality of a designated milk supply is one of the numerous subjects on which a physician is often expected by the layman to express a helpful opinion. In seeking for a guide in this field, the professional worker has had his attention directed recently to various methods of grading or scoring food products. The grading of milk according to quality is now considered essential as a means of improving city milk supplies. Many factors enter into the problem, and at present opinions differ widely in regard to some of them. An experienced student of this subject has ventured this summarized statement: Milk to be of high quality (1) should have a food value suited to the needs of the consumer, (2) should be free from visible dirt, unpleasant odors and tastes, (3) should not contain an excessive number of bacteria, and (4) should be free from disease germs.

The purely chemical examination of milk, including the determination of its content of normal constituents and of the possible presence of deleterious substances,

2. The Porphyrins in Pathology, editorial, THE JOURNAL A. M. A., March 29, 1913, p. 998.

is no longer emphasized as it was formerly. The anxiety as to whether milk was watered or adulterated has given way to a study of other significant features. Some of these, such as odor and taste, cannot readily be analyzed; micro-organisms producing disease are not quickly detected in a practical way, so that the most effective ready criterion at present appears to be the bacterial count in milk.

In recent years there has arisen a system of "scoring" dairies which has been the subject of much criticism and many misgivings, yet has been widely adopted by important communities and food interests. A bacteriologist of the New York State Agricultural Experiment Station[1] has reminded us that the aim of the score card is to emphasize to the producer the importance of cleanliness in handling milk and to designate those places where improvement can be made. At the same time the card serves as a record of the sanitary conditions. There was at first no thought of the score being used as an index of the quality of milk produced. Recently, however, with the growing movement in favor of grading milk according to actual quality, the score card is being used as a convenient means of determining grades of milk. This implies that there is a relationship between the quality of milk and the dairy score.

An investigation conducted at the Geneva laboratories[1] was directed to a comparative study of the bacterial content of the milk—a feature of dominant importance for reasons already referred to—and the "scores" of thirty-four commercial dairies made on three representative cards. The latter cover such features as the health and fodder of the cattle; the location, ventilation and care of the stables; the cleanliness of utensils and personnel; the handling of the milk, and the transportation facilities. Brew's results show no correlation whatever between the quality of milk and the dairy score on the score cards now in use. Milk of all grades is produced in barns which would be excluded on account of low scores, as well as in the high-scoring barns.

These discoveries need not discourage those who are laboring for improved milk supplies. They mean that the current methods of score card grading are not satisfactory. A large number of the items included on the score card apparently have little or no effect on the number of bacteria present in the milk. In other words, too great emphasis is placed on unessential factors in all of the score cards studied, with a consequent lessened emphasis on the factors which actually do affect the milk.

Safety lies in clean milk rather than clean barns. It is encouraging to know that an intelligent dairyman can produce high-grade milk anywhere by the simple observation of the few essential factors of cleanliness and care, and that good milk can be produced with simple equipment. The importance of keeping down the cost of producing high-grade milk is evident. If the present mode of judging the product involves unnecessary or unessential features, it should be modified. In any event, high standards of excellence must not be sacrificed for untested assumptions.

1. Brew, J. D.: Milk Quality as Determined by Present Dairy Score Cards, Bull. 398, N. Y. Agric. Expt. Station, March, 1915.

WHERE IS THE HYDROCHLORIC ACID OF THE STOMACH FORMED?

The existence of a free mineral acid in a tissue or its secretions is of itself a phenomenon of sufficient interest to attract attention to its cause. For this reason the problem of the genesis of the hydrochloric acid of the gastric juice has never lacked investigators. In addition to the perplexing question as to precisely the chemical reaction by which the acid is liberated from the chlorids of the blood or gastric cells, there has existed considerable uncertainty as to the seat of its production.

For a long time the parietal cells of the gastric tubules were charged with the secretion of hydrochloric acid. There is a degree of parallelism between the place of occurrence of a distinctly acid secretion, in the middle region of the stomach, and the distribution of the parietal cells. In the pyloric region, where the secretion is sometimes said to be alkaline, these histologic units are lacking. The investigation of these questions goes back to the days of Claude Bernard, and a decisive demonstration of the validity of the current view has never been furnished. Not long ago a prominent writer[1] in this field frankly admitted that a convincing answer was still to be given to two fundamental questions, namely: Is the hydrochloric acid formed in the parietal cells or indeed in any of the cells of the gastric mucosa, or do the cells merely secrete a preparatory substance out of which in turn hydrochloric acid is liberated either in the ducts of the glands or on the outer surface of the mucosa?

The methods of study applied to this problem have usually been microchemical in character. Miss Fitzgerald[2] applied what was in essence the older procedure of injecting a ferrocyanid and a ferric salt into the circulation of animals and searching for a deposition of Prussian blue, which is produced in the presence of free acid. She believed that she found direct proof of the presence of acid in the lumina of the gastric glands, in the canaliculi of the parietal cells, and even in these cells themselves. In no other place except the immediate vicinity of the parietal cells was the characteristic precipitate formed.

Harvey and Bensley have taken issue with this view as the result of experiments in which they used dyes

1. Bickel, A.: Magen und Magensaft, Oppenheimer's Handbuch der Biochemie, 1910, iii, Part I, p. 72.
2. Fitzgerald, M. P.: The Origin of the Hydrochloric Acid in the Gastric Tubules, Proc. Roy. Soc., London (B), 1910, lxxxiii, 56.

that give different colors in neutral, acid and alkaline mediums.[3] They maintain that the free acid is found only on the internal surface of the stomach or in the neck of the glands. The parietal cells are said to exhibit an alkaline reaction. The hypothesis is accordingly advanced that the parietal cells secrete a chlorid of an organic base, and this compound in some way yields free hydrochloric acid only after it reaches the mouth of the gland.

The conflicting conclusions and the evidence on which they are based have been subjected to a critical examination by Dr. F. S. Hammett[4] in the laboratories of the Harvard Medical School. The details involve intricacies of technic and analysis which are of direct interest to the specialist, but can scarcely be appreciated by the general reader. It may suffice, therefore, to record here the fact that this latest consideration of the much debated problem is regarded by its author as a stable confirmation of Miss Fitzgerald's well-known experiments and conclusions.

FACTORS IN THE RESISTANCE TO TRANSPLANTED CANCER

At the present time, much of our hope for a successful solution of the cancer problems rests on the outcome of experiments on cancer transplantation in animals. Every new suggestion derived in this way is eagerly welcomed and followed up. Studies in the behavior of tissue grafts have not infrequently given a cue to observations on the development of cancer grafts. Thus, there has been found to be a resemblance between the mode of destruction of a failing tissue graft in a host of foreign species and the behavior of a homologous cancer graft in an animal with an induced or a natural immunity to transplanted cancer.

In the case of the transplantation of foreign tissue, a local lymphoid reaction appears early in the process, and lasts until the destruction of the tissue is complete. It has been shown that if an organism which normally has no resistance or defensive agencies against cells of a foreign species is supplied with adult lymphoid tissue, it may become resistant. Conversely, if a normal adult animal is deprived of the major part of its lymphoid tissue by exposure to the Roentgen ray, the ability to destroy the cells of a foreign species seems to be lost. The foreign tissue continues to grow as it would in its native host.

The extent to which lymphoid tissue may be a potent factor in the destruction of a cancer graft in animals possessing some degree of immunity to such transplants has been investigated recently at the Rockefeller Institute for Medical Research. Murphy and Morton[1] have studied the lymphocytes in animals exhibiting so-called "natural" immunity, and likewise in those endowed with the induced variety which is developed by previous injections of suitable living tissue material. They found that in mice with induced immunity, the circulating lymphocytes show no change either in actual numbers or relative proportions to the other white cells during the requisite period which must elapse between the immunizing tissue injection and the cancer inoculation. Within twenty-four hours after the cancer graft is introduced, however, there is a sharp rise in the number of these cells, continuing for many days and reaching an average maximum of nearly 300 per cent. above the normal figure. The other white cells of the blood retain their normal level. The naturally immune animals, which are able without treatment to overcome cancer graft, showed a similar response on the part of the lymphocytes. The period of increase, however, is not begun so soon after the inoculation, and the increase itself is not so pronounced. Otherwise there is a similarity in the lymphoid responses. In animals in which the cancer graft resulted in a take, the changes in the lymphocytes were minimal.

Further evidence of the importance of this lymphoid reaction in the immunity process was obtained by damaging the lymphoid tissue through exposures of immune animals to the Roentgen ray. Murphy and Morton report that this treatment resulted in complete destruction of the immunity. When the lymphoid reaction described is prevented by a previous destruction of the lymphoid tissues, cancer grafts may grow with accelerated vigor. Hence it is concluded that the lymphocyte is a necessary factor in cancer immunity.

DEATH CAMAS

Our domestic animals are exposed to a variety of noxious agencies usually only of indirect interest to physicians. Unless the harmful factors represent sources of infection to man, they do not concern the medical world further than to indicate possible hindrances to the expected supply of food and clothing which are derived from animal sources. Sometimes the scientific problems involved deserve attention, quite aside from the practical aspects of the subject.

The zygadenus is a poisonous plant abundant on many of the stock ranges of the West, and is one of the most important sources of loss to sheepmen. Apparently all species of zygadenus are poisonous. The plants are poisonous through the whole season of their growth, but the tops are somewhat more poisonous at the time of flowering. The toxicity of the bulbs and tops is about the same, while the seeds are much more toxic than other parts of the plant. Cases of

3. Harvey, B. C. H., and Bensley, R. R.: Upon the Formation of Hydrochloric Acid in the Foveolae and on the Surface of the Gastric Mucous Membrane and the Non-Acid Character of the Gland Cells and Lumina, Biol. Bull., 1912, xxiii, 225.

4. Hammett, F. S.: The Source of the Hydrochloric Acid Found in the Stomach, Anat. Rec., 1915, ix, 21.

1. Murphy, James B., and Morton, J. J.: The Lymphocyte as a Factor in Natural and Induced Resistance to Transplanted Cancer, Proc. National Acad. Sc., 1915, i, 435.

poisoning are more likely to occur before the maturity of the plant, because at that time other forage is scanty. The species of zygadenus are known under a number of popular names; the most common perhaps is death camas. In the Northwest, lobelia is the name used possibly even more generally than death camas. Other names are soap plant, alkali grass, water lily, squirrel food, wild onion, poison sego, poison sego lily, mystery grass and hog's potato.

Through a recent report from the U. S. Department of Agriculture,[1] we learn that several investigators have mentioned symptoms of poisoning with death camas in man. Heller[2] gives the symptoms as "nausea, headache, followed by more or less stupor." He states that the heart's action was lessened in frequency, while the strength of the pulse remained normal. The respirations were almost normal. In another case, vomiting was followed by the loss of all power of feeling. Heyl and Raiford[3] and Hunt speak of the irritating character of the dust when the dry plant is being ground, which leads to sneezing on the part of those doing the work. The Lloyds[4] give as symptoms in man "extreme thirst, constant vomiting, dilation of the pupil, coma, and inflammation of the stomach." They also say that in one case there were very violent convulsions. Chesnut[5] says that the symptoms in poisoned Indians are "burning and smarting in the mouth and esophagus, dumbness, nausea, profuse vomiting, foaming at the mouth, dizziness and mania."

In view of the related experiences in human cases, it is perhaps important to know the principal symptoms of intoxication in sheep, the species to which the fatalities are almost entirely confined. They experience salivation, nausea, muscular weakness, coma and sometimes attacks of dyspnea. The poisonous principle of the plant is an alkaloid or alkaloids allied to veratrin. This was first shown by Slade[6] of the Arizona Agricultural Experiment Station, who isolated a mixture of alkaloids from *Zygadenus venenosus*. He concluded that the death camas contained sabadin, sabadinin and veratralbin. At the University of Wyoming Experiment Station, a crystalline alkaloid, zygadenin, has actually been isolated from death camas leaves.[7] Its toxicologic behavior is much like that of veratrin. The resins of the plant appear to be physiologically inert.[8]

1. Marsh, C. D.; Clawson, A. B., and Marsh, H.: Zygadenus, or Death Camas, Bull. 125, U. S. Dept. Agric., May 13, 1915.
2. Heller, A. A.: The Death Camas, Muhlenbergia, 1909, v, 52.
3. Heyl, F. W., and Raiford, C.: Analysis of Zygadenus Intermedius, First Paper, 21 Ann. Rep., Wyoming Agric. Expt. Sta., 1910-1911, p. 62. Jour. Am. Chem. Soc., 1911, xxxiii, 206.
4. Lloyd, J. U., and Lloyd, C. G.: Zygadenus Nuttallii: the Death Camass of the West, Am. Druggist, 1887, xvi, 141.
5. Chesnut, V. K.: Plants Used by the Indians of Mendocino County, California, Contributions, U. S. Nat. Herbarium, 1902, vii, 321.
6. Slade, H. B.: Some Alkaloids of the Death Camas, Am. Jour. Pharm., 1905, lxxvii, 262.
7. Heyl, F. W.; Hepner, F. E., and Loy, S. K.: Zygadenine, the Crystalline Alkaloid of Zygadenus Intermedius, Jour. Am. Chem. Soc., 1913, xxxv, 258.
8. Heyl, F. W., and Hepner, F. E.: Some Constituents of the Leaves of Zygadenus Intermedius, III. Jour. Am. Chem. Soc., 1913, xxxv, 803.

THE RESPONSE OF DIFFERENT RACES TO HOT CLIMATES

The more recent experiences of white races in the tropics have taught us that the supposed dangers of climate in these parts of the world have been overestimated. The greatest enemies of mankind in the warm countries are not necessarily those associated with climate as such, but rather the group of severe infectious diseases and related insanitary influences to which the inhabitants are unduly exposed. When the foreign resident of the tropics has learned to guard himself against prevalent unhygienic conditions, to adjust his mode of life and his personal hygiene to the obvious requirements of his new environment, and to avoid the misuse of alcohol, which increases enormously the other unfavorable and detrimental influences, he need not suffer seriously by comparison with his relatives in the temperate zones.

There are certain inherent peculiarities of the tropical climate which cannot be avoided. Constant high temperature, frequently combined with high atmospheric humidity, must be combated by even the healthiest human organism. These factors call forth increased efforts to cool the body, and hence affect the activity of the skin, lungs and circulatory apparatus. The results of this increased performance are exhibited by fatigue on slight exertion and decreased nervous and muscular efficiency. In Calcutta the temperature ranges from 18 C. (64.4 F.) to 28 C. (82.4 F.); in Batavia it averages 26 C. (78.8 F.); in Sierra Leone, 27 C. (80.6 F.), and temperatures as high as 50 C. (122 F.) in the shade are not infrequent in parts of India. To these influences may be added the more problematic effect of light, which is exaggerated by the high position of the sun and the consequent directness of the solar radiations.

The colonization of the warm countries by inhabitants of the cooler zones has repeatedly raised questions as to the fitness of the white races for life in the tropics. There is a reasonable agreement that the black races tolerate the hotter climates more successfully. At any rate, they can apparently engage in physical exertion under tropical conditions with less distress than is experienced by the unacclimated white races. Are there physiologic reasons for this unlike response to extreme climatic conditions?

He who embarks on the discussion of the effects of tropical light is likely to enter a sea of controversy. The most conspicuous difference between the white races and the natives of the tropics lies in the pigmentation of the skin. Sunlight is admittedly a stimulus to the development of pigment, unless the exposure is so severe as to lead to erythema and sunburn. The comparative permeability of pigmented and unpigmented skin, as exemplified in the negro and white races, respectively, has been debated without demonstrating conclusively — let us express this with due

reserve — that the pigment has any pronounced significance in the loss of heat from the body by conduction and radiation. Apparently the pigment can function to absorb light and actinic rays, and protect the deeper tissues from damage by radiations of short wave length.

After all, heat furnishes the chief menace with which the tropical inhabitant has to contend. The body temperature of white men and negroes both at rest and during mild exertion is alike in the two races in the tropics;[1] that is, there are no unusual adjustments of the average body temperatures of the unlike individuals. Dr. Stigler[2] of the physiologic institute at the University in Vienna has sought to locate the cause for the admitted superior tolerance of the black races to excessive heat, particularly under conditions of vigorous exercise. He has observed that, so long as the loss of heat is unobstructed, the body temperature of the negro shows a slighter rise during work at high external temperatures than does that of the white man; furthermore, the "heated" negro cools to the normal more promptly than does the white man.

These inequalities in the response to overheating of the body do not manifest themselves when the discharge of heat is impeded as it is, for example, in the steam, hot air or hot water bath. The two races respond alike when the possibility of eliminating heat in the usual ways is inhibited by the character of the environment. This may be taken to indicate that the negro does not possess any unique regulatory mechanism which enables his body to decrease its oxidative processes in any degree conspicuous in comparison with the normal metabolism of the species. According to Stigler, the more advantageous heat regulation of the negro is likewise not founded on any relatively more copious sweat production. Negroes and white men both perspire in excess under the provocation of warmth.

In view of the known facts, Stigler has reached the conclusion that the apparently superior heat regulation in the negro must be due to a more extensive loss of heat by conduction and radiation. This means, of course, a greater participation of the surface layers of the body. We are reminded that the cutaneous blood vessels of the negro are said by histologists to exhibit a comparatively large size and lumen. Perhaps they respond more effectively than do the skin capillaries of white races in the way of vasodilation. The increased removal of heat in this purely physical way by more extensive conveyance of heated blood to the skin areas makes itself manifest only when the accumulation of heat is pronounced. The temperature at which the bath produces a subjectively "neutral" sensation is the same, 34 C. (93.2 F.), for white men and negroes.

The critical reader of Stigler's investigations will note that they are based on rather meager data. If they become further substantiated, it will be highly probable that the superior temperature regulation of the negroes is an acquired characteristic developed by use. From this point of view, one may perhaps expect healthy white persons likewise to endure the tropical heat more effectively in the course of time. At present other hygienic factors still complicate the interpretation of the welfare of white races in the warm climates.

1. Lode, A.: Das Klima, Rubner-Gruber-Ficker Handbuch d. Hyg., 1911, i, 696.
2. Stigler, R.: Vergleich zwischen der Warmeregulierung der Weissen und der Neger bei Arbeit in überhitzten Räumen, Arch. f. d. ges. Physiol., 1915, clx, 445.

Current Comment

THE EXCRETION OF MERCURY

The appreciation of the fact that the gastro-intestinal tract can serve, not only as the seat of absorption of substances taken into it, but also as a path of excretion from the body, has tended to modify both theory and practice in medicine. To cite one or two examples, the fact that iron does not appear in large amounts in the urine after administration of medicinal preparations of this element is no longer looked on as prima facie evidence that it has never entered the metabolism; for physiology now teaches that iron salts are reexcreted by the bowel. The same is true of salts of calcium and other elements; and these facts have taught the necessity of reckoning with the alimentary tract in estimating the loss of specific elements from the organism. The location for the excretion of different substances from the circulation into the gastro-intestinal canal varies in individual instances. There is no longer any question that the stomach may participate in these excretory functions quite as well as the portions of the alimentary tract farther away from the mouth. Substances that are excreted by the alimentary tract may be partially absorbed again by lower divisions of the tube. This helps to explain what is not yet sufficiently recognized in relation to the behavior of some compounds in the body, namely, that their elimination by the route of the intestine is through an ever-repeating circle of excretion and reabsorption and is therefore slow. Of this morphin is an example. It is excreted freely into the stomach and reabsorbed from the intestinal tract farther on. Gastric lavage, therefore, is a helpful procedure in facilitating the removal of this drug in cases of poisoning. The experiments of Lieb and Goodwin[1] add mercury to the list of elements which are probably excreted by the gastric mucous membrane. It has been known for a long time that mercury may be recovered from the stomach washings of patients who are under the systemic influence of this metal, quite independently of the mode by which it is administered. It is conceivable, of course, that mercury

1. Lieb, C. C., and Goodwin, G. M.: The Excretion of Mercury by the Gastric Mucous Membrane, THE JOURNAL A. M. A., June 19, 1915, p. 2041.

may reach the interior of the stomach because it is secreted in the saliva and swallowed with the latter; or it may come from lower portions of the digestive tract, such as the duodenum, by regurgitation. It has been suggested that the cycle of absorption, excretion and reabsorption in the case of mercury may explain its persistent systemic action and account for the prolonged stay in the organism. The investigations of Lieb and Goodwin on animals in which the possibility of salivary contamination was averted still showed the presence of mercury in the stomach after subcutaneous administration of the chlorid. The gastric path of excretion is thereby established, and this fact indicates gastric lavage to be an essential part in the routine treatment of mercurial poisoning.

EDUCATING THE FARMER IN MINNESOTA

State public health work in our more advanced communities has passed from the propaganda stage to that of detailed systematic study of essential factors and the devising of effective methods for improving living conditions. One of the most important problems encountered—important not only on account of the number of people involved, but also on account of its neglect for many years—is the problem of waste disposal in unsewered districts. And a question, of necessity closely correlated to it, is that of pure water supply in rural districts. In communities large enough to assume the burden of constructing and maintaining sewage systems and water-supply plants, the problem is practically reduced to one of efficient administration. But what of the isolated farm house? How can the rural family safely dispose of its waste, and how can it secure pure water at a cost that is within the resources of the average farmer? Two pamphlets, recently issued by the Minnesota State Board of Health, contain clear, practical advice on these two important questions. One, "Sewage Disposal in Unsewered Districts," gives plans for disposing of sewage from an ordinary farm house with diagrams of the various parts of such a system; the other, "Farm Water Supplies," was originally prepared for farmers but has been endorsed by the State Department of Education for use in connection with the water supply for rural schools. The dangers of impure water are discussed, and the various types of underground and surface water supplies considered. Numerous explanatory diagrams show the dangerous and the safe arrangement for dug wells, bored wells, springs and cisterns. The conventional illustration showing well pollution by seepage through soil is, according to the pamphlet, misleading, contamination usually taking place around the top, through either imperfect construction of the wall casing, or through lack of care in keeping the wall in repair. The pamphlets will be of inestimable educational value in the rural districts. One addition would be of value, that is, an estimate of cost, both for different methods of sewage disposal and for water supply. The question is essentially an economic one. Any rational person would rather live in a well-sewered house and enjoy a pure water-supply, than be without these necessities of modern life. The important question is that of expense. If it can be shown that healthful methods are not prohibitive from the financial point of view, and are in the end much less expensive than sickness, the argument for sanitary methods will be greatly strengthened.

VICTORIES OF A NEUTRAL IN THE WAR

In tribute to the United States for its victorious fight against typhus in Serbia, Sir Thomas Lipton, who, among others, furnished funds and equipment for the campaign, says, "Credit for the work of sanitation, which is rapidly making typhus a thing of the past, must go to the Americans, whose magnificent efforts have made them loved by every Serbian from the king to the lowest peasant, all of whom seem fully to appreciate the efforts of the Red Cross in their behalf." Commenting on this, the St. Paul *Pioneer Press* says:

> But this is not our only decisive "victory" in the European war. Some months ago correspondence set forth the gratitude of the people of Belgium for having been saved by American generosity from starvation. The name "America" has become a household word of reverence and affection; the Stars and Stripes were worshiped along with the colors of Belgium.
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> No intelligent and civilized American would exchange the honor of these two signal victories of peace and good will for the most terrific victory of shot and shell which has been or will have been won on the blood-soaked fields from Calais to Constantinople. They were no less battles of brains and of courage than are the battles of cannon. Their objective was not destruction but construction, not death but life.

DANGER IN SUN BATHS

Editorially and otherwise we have called attention at various times to the deleterious or even dangerous influence of prolonged exposure of the body to the bright sunlight in those who have not been accustomed to its rays. Grawitz,[1] especially, called attention to this danger some years ago. Römer[2] now brings up the subject again, saying that lying on the sand for hours in the sun has become such a popular pastime that at a single one of the Hamburg resorts there were 18,000 taking the sun bath one Sunday. The damage is more than the sunburn resulting, as he shows by two cases reported in detail, in which headache and symptoms of serous meningitis developed after the youths had been lying several hours in the sunlight with unprotected head and no clothing but bathing trunks. Spinal puncture confirmed the assumption of serous meningitis and relieved the headache. The sun's rays had evidently penetrated the skull, he says, thus again demonstrating that sunstroke is the consequence of direct exposure to the sun. Grawitz warned that those inclined to be nervous were particularly predisposed to injury of the nervous system from this cause, and Römer adds that it is the anemic and nervously predisposed city indoor workers with whom these sun

1. Grawitz, E.: Schädliche Wirkungen der Sonnenbäder, Deutsch. med. Wchnschr., Aug. 19, 1909; abstr., THE JOURNAL A. M. A., Sept. 25, 1909, p. 1066.
2. Römer: Deutsch. med. Wchnschr., July 8, 1915, p. 832.

baths are most popular. A tanned and vascular skin is said to protect better against injury from the sun's rays, but the city dweller's skin is neither pigmented nor vascular. Instead of being benefited, the nervous are rendered more nervous, and when the summer is over they are tanned but otherwise in poorer condition than in the spring. Römer says that no one welcomes more than the physician the "back to Nature" tendency of recent years, but it is his task to warn against excesses and abuses in the "enjoyment of Nature." Even Rollier, the most expert and most successful adherent of heliotherapy, manages the exposures to the sunlight with extreme care, exposing only slowly and gradually larger and larger areas of the body to the sunshine. Dorno relates that "at Davos the direct sunlight is avoided almost as something inimical." Römer remarks that the physician will only in rare instances be able to influence this popular "sun baths sport," but he can at least raise a voice of warning of the dangers of sun baths, and urge the necessity for proper dosage, some persons being more sensitive to the sun's rays than others. Only in this way can heliotherapy be correctly estimated and properly applied.

NEW FEE-SPLITTING LAW IN WISCONSIN

In 1913, following considerable discussion of the fee-splitting evil, the Wisconsin legislature passed a law making it a fraud for a surgeon to offer or to pay a commission for surgical patients referred to him. No penalty was imposed by this law on the receiver of the commission. An amendment recently passed by the present legislature provides that "any physician or surgeon . . . who shall . . . demand, receive or retain any money or other consideration directly or indirectly from the physician or surgeon treating or operating on the patient so induced or advised shall be guilty of a criminal fraud." The penalty for either giving or receiving a commission for surgical cases is fine or imprisonment, while conviction is made an automatic annulment of the license to practice. The law as amended should be broad enough and strong enough to put a stop to whatever fee-splitting evil there may be in Wisconsin.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALASKA

Medical Board Appointments.—Governor Strong announced on July 30 the following appointments as members of the Alaska Medical Board: first division, Drs. Harry C. De Vighne, Juneau, and Earl M. Bevis, Juneau; second division, Drs. John H. Mustard, Nome, and Curtis W. Welch, Council; third division, Drs. Joseph H. Romig, Seward, and Charles A. Winans, Valdez; and fourth division, Drs. James A. Sutherland, Fairbanks, and Aline B. Bradley, Fairbanks.

GEORGIA

Field Hospital at Tobyhanna.—Field Hospital Company No. 1, Georgia National Guard, under the command of Major Arthur G. Fort, Atlanta, was in camp at Tobyhanna, Pa., from August 6 to 14.

District Society Meeting.—The annual meeting of the First District Medical Society was held in Savannah, July 27, and the following officers were elected: president, Dr. G. W. Elarbee, Daisy; vice presidents, Drs. William W. Evans, Halcyon Dale, and Daniel B. Edwards, Savannah; and secretary-treasurer, Dr. Charles Usher, Savannah (reelected).

Personal.—Dr. William N. Adkins was elected chief examiner of the medical inspection department of the city schools, Atlanta, July 31, succeeding Dr. Robert G. Stephens, resigned. ——Dr. William P. Harbin has been appointed health officer of the new health district established under the recent act of the Georgia Legislature at Rome.——Dr. Walpole C. Brewer, Atlanta, who is in Europe, has been assigned to duty at a hospital on the Austro-Russian frontier.——Dr. A. E. Sally, Augusta, is reported to be seriously ill at his home.——Dr. William P. Nicolson, Jr., Atlanta, has arrived in France and assumed his duties with the American Hospital, Paris.——Dr. Claude A. Smith has been reelected city bacteriologist and chemist of Atlanta for the eleventh term.——Dr. Joseph H. Bradfield, Atlanta, has been elected superintendent of the Municipal Tuberculosis Sanatorium at Battle Hill, succeeding Dr. George L. Loden, Atlanta, resigned.

ILLINOIS

Personal.—Dr. Argal E. Hubbard, for two years medical director at the Ottawa Tent Colony, has resigned and will practice in Peoria.——Dr. William A. Nason, Algonquin, who has been confined to his home for several months, is reported to be convalescent.

Hospital Plans Ready.—Plans for an addition to the Peoria Municipal Isolation Hospital have been completed and work on the new building will be started early this fall. The new building will be separated entirely from the present hospital. It will be a one-story brick structure and will contain ten rooms for use and care of patients and three wards for observation purposes, with the necessary laboratories and supply rooms. The city council has appropriated $10,000 for the construction of the building.

Chicago

Personal.—A dinner party was given August 5, in honor of the fiftieth birthday of Dr. William A. Evans.——Dr. Joseph P. Smyth was elected high medical examiner of the Catholic Order of Foresters at its meeting in Providence, August 5.

Concentration of Sanatorium Administration.—The administration of the Municipal Tuberculosis Sanatorium is to be concentrated at the institution. Headquarters in the city will be maintained only for the medical director and head nurse. The trustees believe that an annual saving of about $10,000 will be made by this change.

Daily News Sanitarium.—The construction of the new sanatorium building at Lincoln Park has been postponed on account of the delay in the preparation of the site on the newly made island opposite the present location. It is hoped that the work on the new building may be commenced this fall. The contributions to the building fund last year amounted to more than $10,000, and the fund on January 1 exceeded $43,000. As the cost of the building is estimated at $90,000, about $50,000 remains to be secured, and an urgent effort is being made to this end.

Midwife School.—The Municipal School of Midwifery was founded August 7 and will have its headquarters in the Iroquois Memorial Hospital. A faculty of competent physicians will instruct the midwives. Dr. Henry F. Lewis, head of the obstetric department of the Cook County Hospital, will be dean of the school, and associated with him are Drs. Rudolph W. Holmes, William G. Lee, Carey Culbertson, Otto H. Rohrlack, Gilbert Fitzpatrick, Arthur H. Curtis, William H. Rubovits, Joseph L. Baer, Bertha Van Hoosen, Effa V. Davis and Mark T. Goldstine. Attendance at the school cannot be made compulsory, but with the power conferred on the health authorities by recent legislation, it is hoped to induce midwives to take the instruction.

INDIANA

New Hospital at Marion.—Contracts have been let for the construction at Marion of a three-story and basement hospital building.

Personal.—Dr. John Kolmer, Indianapolis, is seriously ill in St. Mary's Hospital, Rochester, Minn., following an operation for gastric carcinoma.——Dr. Leonidas Mason, Bluffton, suffered a cerebral hemorrhage August 4 and is reported to be improving.——Dr. Jehu Z. Powell, Logansport, who was operated on recently at St. Vincent's Hospital for the removal of gallstones, is reported to be convalescent.——

Dr. Herman H. Kamman, Columbus, fractured his right arm above the elbow and dislocated his right arm at the shoulder, while cranking his automobile, recently.——Dr. William L. Thompson, Mooresville, suffered a fracture of a rib and severe bruises in a collision between his automobile and another motor car, recently.——Dr. N. Austin Cary, Crawfordsville, has passed his examination and has been commissioned Captain in the Medical Corps, Indiana National Guard.

MASSACHUSETTS

Health Movies.—The State Department of Health has prepared moving-picture films which portray the evils of insanitary conditions, neglected children, the ravages of typhoid, and the bad results of improper health conditions, and these films may be obtained for exhibition by any city, town, school or organization which makes application.

Personal.—Dr. Francis X. Mahoney, for several years chairman of the Health Board of Boston, has been appointed health commissioner.——Dr. Franklin G. Balch, who was to have sailed for Europe, July 31, was unable to sail and it will therefore be necessary for Dr. Edward H. Nichols, in charge of the Harvard unit in France, to select one of his chief surgeons as head of the unit when he sails for home, about August 20.——The appointment of Dr. Elisha H. Cohoon, for eight years a member of the staff of the Rhode Island State Hospital for the Insane, Howard, as administrator of the Psychological Hospital connected with the Boston State Hospital, has been approved by the executive council and the State Board of Insanity.

MARYLAND

Personal.—Frederick C. Blanck, head of the Bureau of Food and Dairy Inspection of the Baltimore Health Department since 1911, has resigned to accept a position in the Bureau of Chemistry in the United States Department of Agriculture, Washington, D. C.——Dr. John F. Hawkins, Baltimore, sustained painful injuries in a collision between his automobile and another motor car, recently.——Dr. James E. Gauline, Baltimore, together with his wife and a male nurse, was chloroformed and robbed while asleep.

MINNESOTA

Laboratory Reestablished.—The work at the Mankato branch laboratory of the State Board of Health, the activities of which were discontinued in April owing to lack of funds, was resumed August 2.

Infectious Diseases for July.—The report of the city health department of Minneapolis shows that during the month of July there were 15 new cases of infectious diseases. Of these 2 were diphtheria, 6 measles and 7 smallpox. Of the 7 smallpox cases not one had ever been vaccinated. Seven cases of pulmonary tuberculosis were also reported during the month of July, all among miners.

Personal.—Dr. Edward W. Buckley, St. Paul, was elected supreme physician of the Knights of Columbus, at its annual convention in Seattle, August 4.——Dr. Frank H. Knickerbocker, Staples, has been appointed a member of the Todd County Sanatorium Commission for two years.——Dr. Harold Stone, Minneapolis, has started for France where he will take up work with the American Ambulance, Paris.

Faculty of Graduate School of Medicine.—At a recent meeting of the regents of the University of Minnesota the faculty of the graduate school of medicine and the Mayo Foundation were merged. The faculty is named as follows: Dr. Charles H. Mayo, professor of surgery; Drs. Edward S. Judd and Emil H. Beckman, associate professors of surgery; Drs. Christopher Graham and Harry S. Plummer, associate professors of medicine; Drs. Herbert Z. Giffin and Walter D. Sheldon, associate professors of medicine; Dr. William F. Braasch, professor of urology; Dr. Melvin S. Henderson, associate professor of orthopedics; Dr. Carl Fisher, associate professor of ophthalmology and otology; Dr. Justus Matthews, associate professor of rhinology and laryngology; Dr. Russell D. Carman, professor of roentgenology; Dr. Louis B. Wilson, professor of pathology; Dr. William R. McCarthy, associate professor of pathology; and Dr. Edward C. Rosenow, professor of experimental medicine.——The regents also have appointed a special committee on reorganization for the graduate school. This committee consists of Drs. James E. Moore, Clarence M. Jackson and Jennings C. Litzenberg, from the medical faculty; and Drs. Louis B. Wilson, William F. Braasch and Melvin S. Henderson from the Mayo Foundation.——Dr. Richard O. Beard has been appointed assistant dean of the medical school.——The resignations of Drs. James S. Gilfillan, Peter A. Hoff, and Charles D. Freeman, St. Paul; and Drs. John E. Hynes and George D. Head, Minneapolis, from the faculty, have been accepted.

NORTH CAROLINA

Sanatorium Fire.—The Elbermar, a tuberculosis sanatorium at Asheville, was seriously damaged by fire, July 18. The patients were removed without casualty.

Laboratory for Winston-Salem Hospital.—Arrangements have been made by the hospital commission for the installation of a modern laboratory equipment at the City Hospital, Winston-Salem.

Sanatorium for Fraternal Order.—A committee from the supreme council of the National Union recently visited Asheville and secured an option on a large tract of land in Buncombe County on which it is proposed to erect a sanatorium for tuberculosis for the use of afflicted members of the order.

Typhoid Fever at Greensboro.—More than forty-five cases of typhoid fever were reported in the epidemic at Greensboro up to July 31. Nine deaths have occurred and up to the present two sources of infection, the one, a well in which dairy utensils have been washed and the other a spring in a suburb of the city, have been found and the health authorities are using every exertion to restrict the disease.

NORTH DAKOTA

The Dunseith Sanatorium.—Members of the State Board of Control held a meeting July 12 to consider bids for the State Tuberculosis Sanatorium at Dunseith. The last legislature made an appropriation for three new structures, namely, $2,800 for a refectory building, $4,500 for a cottage for the superintendent and $4,500 for a dairy barn and silos. Appropriation were also made of $3,500 for a heating plant for the refectory building, $1,000 for kitchen equipment and $1,000 for a cold-storage plant.

Hospital News.—A contract for the erection of a building for the new Effington Hospital was let July 24. The building is to be of brick, two stories and a basement in height, and 53 by 34 feet.——Contracts for $18,580 have been let for the erection of a new power house and addition to the Grand Forks Deaconess Hospital. The building will be of fireproof construction, three stories and a basement in height, and will add thirty-two rooms to the hospital.——St. John's Hospital, Fargo, has awarded a contract for the erection of a nurses' home to cost $50,000.——The directors of St. Luke's Hospital, Fargo, are arranging for an addition to that institution which will more than double its facilities.——Bids are advertised for the new $25,000 hospital to be erected at Kenmare. The building is to be two stories and a basement in height, of brick and fireproof construction and located immediately south of the present hospital and will be connected with it. ——Elmer Hospital at Arnegard will be reopened in the near future.

NEW YORK

Personal.—Dr. Frederick B. Bowman, Buffalo, has accepted an appointment in the Canadian army, hydrologic corps, and has arrived in England.——Dr. Albert H. Ely, New York City, has been reelected president of the Southampton Village Improvement Association.——Dr. Lowyd W. Ballantyne, Syracuse, has been commissioned Lieutenant, Medical Corps, N. Y. N. G., and assigned to duty with the local company. ——Dr. Wardner D. Ayer, has assumed charge of the laboratory connected with the Syracuse Bureau of Health.

Activity in the Enforcement of Vital Statistics Law.—Active steps are being taken by the State Department of Health to enforce the law requiring the report of births by physicians within five days. Dr. Hermann M. Biggs, state commissioner of health, has sent to district attorneys throughout the state, a list of physicians to have been persistently negligent in this matter and the county prosecutors have been asked to warn the offending physicians that further infractions of the law will be promptly prosecuted. The county prosecutors are practically unanimous in the belief that the offending physicians should be brought to trial. The penalty for violation of this law is that the violator "shall for the first offense be fined not less than $5 nor more than $50 and for each subsequent offense not less than $10 or more than $100 or be imprisoned in the county jail not more than sixty

days, or be both fined and imprisoned, in the discretion of the court."

New York City

New Milk Station.—A new milk station has been opened at 752 Onderdonk Avenue, Ridgewood, Borough of Queens. No definite district has been outlined for this station, and it is expected that the clientele will be drawn from the surrounding area.

Typhoid Fever in Brooklyn.—The Bay Ridge district of Brooklyn is suffering from an epidemic of typhoid fever. Up to August 5 thirty-eight cases had been reported. The department of health has detailed nurses to visit every family in the affected area and to distribute literature and advice with reference to the preventive measures to be adopted.

Campaign Against Mosquitoes in Queens.—A mass meeting was held in Forest Hills, July 5, at which time deputy health commissioner, Dr. Haven Emerson, and others spoke and resolutions were passed urging the borough president to go ahead with the draining of the Flushing and Jamaica Bay marshes, and an executive committee with representatives from all the villages in Queens was formed for the purpose of arousing interest in efforts looking to the extermination of this pest in the Borough of Queens.

New Procedure in Measles.—In cases of measles a new method of procedure has been adopted by the health department. All cases reported by physicians are acknowledged by the borough office, but no visits are made by nurses. All cases reported from lay sources are visited by the district diagnostician to confirm the diagnosis. A copy of the measles hanging card will be sent to every home from which a case of measles is reported. After September 1 a new special acknowledgement card with school certificates attached will be used and supplementary instruction will be issued at that time.

Clinic Studies Fur Trade.—Since the opening of the clinic for occupational diseases by the department of health, an investigation of the fur industry has been carried on. The statistics compiled by the health department show that in the fur trade mercurialism was found in 1.5 per cent. of the persons examined, partial deafness in 16 per cent., asthma in 2 per cent. and eczema in 4 per cent. The health department has issued recommendations to the manufacturers of fur advocating the following: Provision of devices to remove hair, dust, fumes, gases and vapors from the workshops; to forbid sweeping during working hours; to demand the use of rubber gloves by those handling dyes and chemicals; to make provision for proper ventilation of street clothing, and the abolition of the common drinking cup.

OKLAHOMA

State Board Election.—At the annual business session of the State Medical Board held in Oklahoma City, July 13, Dr. LeRoy Long, McAlester, was elected president, and R. V. Smith, Tulsa, secretary.

New Institutions for Indians.—The new Indian Hospital, Fort Sill, erected at a cost of $40,000, is now opened to all patients.——Plans are being prepared for an Indian sanatorium to be built at Talihana, to cost $250,000.

Personal.—Dr. Everett G. Newell, Supply, has resigned the superintendancy of the State Hospital and has been succeeded by Dr. Charles B. Hill, Guthrie.——Dr. Romney E. Johnston, Bridgeport, was severely burned recently while lighting the gas in his house.——Dr. Charles L. Simmons, Orlando, has been appointed physician to the Agricultural and Mechanical College at Stillwater.——Dr. Robert H. Harper, Afton, has returned to St. Louis where he will enter a hospital for treatment.——Dr. James M. Workman, Woodward, who was recently operated on in a hospital in Wichita, is reported to be doing well.——In a collision between a Santa Fe train and his automobile in Oklahoma City, Dr. William N. Taylor sustained a fracture of the left arm and other severe injuries and is under treatment in St. Anthony's Hospital.——Drs. Newton H. Lindsay and James R. Calloway have been selected as physicians for the State Training School, Paul's Valley.——A leave of absence has been granted to Dr. Walter L. Capshaw, professor of anatomy in the medical school of the State University, Norman.

OREGON

New State Health Officer.—Dr. David N. Roberg, Portland, who was elected state health officer several months ago to succeed Dr. Calvin S. White, arrived in Portland, July 10, from China where he has been engaged in research work for the past two years.

State Board Election.—At the annual meeting of the Oregon State Board of Medical Examiners held July 31, in Portland, the following officers were elected: president, Dr. Charles T. Chamberlain; secretary, Dr. Luther H. Hamilton (reelected), and treasurer, Dr. Herbert S. Nichols, all of Portland.

Antituberculosis Society Organized.—The Oregon Society for the Prevention of Tuberculosis was organized at a meeting held in Portland, July 2. Drs. Ralph C. Matson, Portland, and Edward A. Pierce, Portland, were elected members of the executive committee and the following physicians members of the board of directors: Drs. Grover C. Bellinger, Salem; Arthur W. Chance, Portland; Harvey J. Clements, Salem; Urling C. Coe, Bend; Matthew H. Ellis, Albany; Edward P. Geary, Portland; Kenneth A. J. MacKenzie, Portland; Mary MacLachlan, Portland; Ralph C. Matson, Portland; Ray W. Matson, Portland; Willis B. Morse, Salem; Edward A. Pierce, Portland; Elijah B. Pickel, Medford; Henry C. Randle, Nehalem; Alan Welch Smith, Portland; Charles J. Smith, Portland, and Robert W. Stearns, Medford.

PENNSYLVANIA

Orphanage Quarantined for Smallpox.—The Orphanage of the United Brethren Church at Quincy was quarantined August 4 by the chief medical inspector of the state, Dr. Benjamin F. Royer, because one of the matrons was found ill with smallpox. The ninety-seven children have been vaccinated.

Faculty Change.—Dr. John Jenkins Buchanan, professor of surgery in the School of Medicine, University of Pittsburgh, for the past fourteen years, has resigned his active teaching and has been elected professor emeritus. Dr. Robert Talbott Miller, for the past five years a member of the staff of the department of surgery of the school, has been promoted to the full professorship.

Epidemic at Erie Not Feared.—On August 4 the State Department of Health dispatched a corps of sanitary engineers to Erie under the command of Chief C. A. Emerson. Dr. Samuel G. Dixon, state health commissioner, has issued the following statement of the conditions there: "The work now in progress should insure against any epidemic following the disastrous flood. The water supply in the major portion of the city has remained intact, and those sections where the connections have been destroyed are securing their supplies from a pure source. The floods, of course, have sent sewage polluted water broadcast and the people have been warned against using water from surface wells, and have been warned to observe precautions after working in the débris. The city and state are cooperating to recover the bodies. Four hundred men and seventy-five teams have been at work, and the city authorities have been requested to increase this number. The department of health engineers are on the ground acting in an advisory capacity, and the city authorities, following a resolution of the councils, have welcomed and cooperated with them in every way possible."

Philadelphia

Personal.—Dr. Robert Tait McKenzie has been appointed a captain of the medical corps of the British army and has been given charge of the physical examination of recruits at the Aldershot military training camp.——The honorary degree of Master of Science was conferred on Dr. John A. Kolmer of the University of Pennsylvania, by Villanova College, at its annual commencement, June 17.

Schoolchildren Taught Swimming.—Public school swimming centers, conducted under the auspices of the board of education, have just finished their first term with a record of 390 boys and 558 girls, who know how to swim. Altogether there were 3,000 enrolled for the first term. Of these 1,581 attended the classes and took six or more lessons. After the pupil has learned to swim, a special test is given; the pupil is required to swim for twenty minutes. The swimming centers are open for ten weeks.

Babies' Hospital.—Twenty-five children of all ages from 3 months to 12 years are under treatment at the country branch of the Children's Hospital at Wynnefield. These children have been transferred from the children's hospital on Twenty-Second Street, and will benefit by living on the wide porches. This branch is situated on a 9-acre plat near the Park trolley. The institution has organized a system of

training nurse maids. Under the supervision of Miss Doolan and another trained nurse, ten young women are taking a nine months' course.

SOUTH CAROLINA

District Physicians Meet.—At the semiannual meeting of the Eighth District Medical Society held in Aiken, July 13, Dr. Ransom H. Timmerman, Batesburg, was elected president; Dr. Harry H. Wyman, Aiken, vice president; and Dr. Robert A. Marsh, Edgefield, secretary-treasurer, (reelected). The next meeting will be held in January at Johnston.

Pellagra at Orphanage.—The U. S. Public Health Service has directed Surgeon Joseph Goldberger to take charge of the cases of pellagra at the Epworth Orphanage, Columbia. The disease has been prevalent at the orphanage for a long while and has been spreading during the last year. At present between seventy-five and a hundred of the 250 children at the institution, are affected by the disease.

Hospital Items.—Plans have been prepared for St. Mary's Hospital, Anderson, and contracts were let July 27. The building will cost about $7,000. The plans call for the usual administration rooms, five private rooms for white patients; a male and female ward to hold six patients each; two wards for colored patients, an operating room, diet kitchen, etc. The building will be one story in height with basement, but provision will be made for the addition of another story.——The new State Park State Hospital for the Insane will accommodate 300 patients which will provide for the overflow of the Columbia State Hospital for the time being. Dr. D. C. Sandy is in charge of the occupational training of the patients.——Work on the improvements at the Columbia State Hospital has been commenced. These improvements are to cost $150,000 and call for the construction of a central kitchen and dining room for white female patients and the remodeling of six white male patient wards.

TENNESSEE

New Dispensary for Chattanooga.—An appeal is being made by the leading citizens of Chattanooga for $3,000 with which to establish a free medical dispensary. It is believed that the amount will be subscribed in time to permit the dispensary to be opened about September 1.

Personal.—In the case of Luther Chambers against Dr. Albert T. Ingalls, Chattanooga, in which damages for $25,000 were claimed on account of alleged malpractice, the jury on July 27, returned a verdict exonerating Dr. Ingalls.——Dr. Samuel H. Hodge, Knoxville, who has been in Serbia since November last, has returned home.

CANADA

University News.—Toronto University is now recruiting for its third overseas company.——McGill University has enrolled its third overseas company and is overmanned to the extent of fifty. Application will be made to enrol a fourth company immediately.

Hospital News.—The officers and employees of the Hospital for the Insane, Hamilton, Ont., have contributed a machine gun for the use of Canadians. With the first contingent fifteen employees went to the front, and during the past month sixteen more have volunteered.——The Saskatchewan Overseas Hospital will consist of the following personnel: a lieutenant-colonel, two majors, four captains or subalterns, a quartermaster, a warrant officer, eighty noncommissioned officers and men, one matron, ten sisters and sixteen staff nurses. The medical council as the representative body of the medical profession has the organization in hand and the cost will be $40,000. It is expected that the provincial government will give liberally. It will have a capacity of 200 beds. There will be ten physicians and surgeons.

Personal.—Dr. Malcolm A. Carmichael, Strassburg, Sask., who was recently operated on for appendicitis in the Regina General Hospital, is recovering.——Dr. Arthur S. Gorrell, Regina, who recently underwent a severe operation, has recovered and resumed practice.——Dr. Kidd, medical superintendent of the Hospital for the Insane, Cobourg, Ont., has left to join the Queen's University base hospital staff in England.——Dr. Royal Lee, Ganonoque, Ont., who was taking a course in the Holy Name Hospital, Brooklyn, N. Y., met with a serious accident resulting in concussion of the brain while rushing in an automobile to attend an emergency call.——Dr. Robert S. Thornton, Deloraine, Man., a prominent member of the Dominion Medical Council, was elected to the Manitoba legislature in the recent provincial elections. Dr. Thornton has joined the new Norris government and will administer the department of education.

Canadian Public Health Association.—Owing to the outbreak of the war last year the annual meeting of the Canadian Public Health Association, which was to be held in Port Arthur and Fort William, was canceled. It has been decided by the executive that a meeting will be held this year in Toronto, on September 3 and 4. A program relative to preventive medicine in the exigencies of wartime is being arranged; and in addition papers and discussions will be presented on the usual subjects. There are to be symposiums on housing and on mental defectives and care of the feebleminded.

GENERAL

Mississippi Valley Tuberculosis Meeting.—The annual Mississippi Valley Conference on Tuberculosis will be held September 29 and 30, and October 1, at the Claypool Hotel, Indianapolis. October 1 is the day set for the disease prevention day pageant.

Standardization of Methods.—The National Association for the Study and Prevention of Tuberculosis has appointed a committee of three to investigate into and adopt standard dispensary methods for use through the country. This committee consists of Drs. James Alexander Miller, New York City; William Charles White, Pittsburgh, and George T. Palmer, Springfield, Ill.

Bequests and Donations.—The following bequests and donations have recently been announced:

Hospital for Sick Children, Toronto, Ont., a block of buildings in Colborne, Ont., by the will of Mr. Daniel L. Simmons of that place.

Medical Society of South Carolina and their successors as supervisors of the Riverside Infirmary, Charleston, for the establishment of a memorial to the late Joseph Thompson, from $60,000 to $80,000, by the will of the late Mrs. Rosa Thompson.

S. R. Smith Infirmary, Staten Island, N. Y., $30,000, by the will of Sarah J. Farrar.

St. Luke's Hospital, New York City, $7,500, by the will of Mrs. Augustus L. Jonas.

The Conditions in Mexico.—Economic conditions in Mexico as reported by Mr. C. J. O'Connor, the representative of the American Red Cross in Mexico City, are distressing. The amount of food necessary for an individual per day costs at present nearly $10 Mexican, while the laborer's wage is $0.75 Mexican. The volume of business and manufacturing is steadily decreasing and the only processes at work are said to be destructive.——The civilians in Saltillo are reported to be eating donkey flesh and cactus. No corn or beans can be purchased at any price.——The American Red Cross has now $6,000 worth of groceries en route from New Orleans to Vera Cruz designed for the use of needy Americans in Mexico City.——Much suffering is reported from Guadalajara. The prices of food are prohibitive. Corn, which under normal conditions costs from 4 to 6 cents per liter is now costing from 25 to 40 cents, and beans which ordinarily cost 6 to 8 cents Mexican per liter, now cost from 40 to 60 cents.

Another Confidence Game? American Supply Company.—A physician in Benton Harbor, Mich., who prefers not to have his name mentioned because, as he says, he does not want to be regarded as "an easy mark," writes:

"A man giving his name as C. A. Lewis seems to have been working a confidence game on doctors through this section. He claims to be selling membership in the American Supply Company, of Cincinnati, the holders of which will receive auto supplies at wholesale cost plus 5 per cent., f. o. b. Cincinnati. He collects $7.50 and says catalog will be along in a few days. But the catalog does not come, and a letter to the American Supply Co. of Cincinnati is returned 'unclaimed.' The individual is about 35 years old, 5 feet 10 inches to 5 feet 11 inches in height, weight about 175 pounds, quiet and business-like in his demeanor. As I recollect him, his hair is brown, general appearance slightly approaching the blonde type."

An investigation by a representative fails to reveal the American Supply Company in Cincinnati. Inquiries were made of the Cincinnati Automobile Club and of other automobile and business firms, without locating such a company. The proposition of doing business on a 5 per cent. margin should be sufficient to make one suspicious.

FOREIGN

Suspension of Prague and Vienna Exchanges.—We learn from the *Berliner klinische Wochenschrift* that the *Prager medizinische Wochenschrift*, after forty years of honorable existence as the representative of the German medical men in Bohemia and the organ of the medical faculty of the University of Prague, has suspended publication, it is hoped only temporarily. The *Allgemeine Wiener medizinische Zeitung*, now in its sixtieth year, has also stopped publication.

Fewer Cases of Lead Poisoning in England.—It is noted in the *Supplement to Commerce Reports*, No. 19, July 26, that through careful supervision and under the special rules of the home office, lead poisoning has diminished. According to the report of the departmental committee, 5,299 persons (3,371 males and 1,928 females) were engaged in 1907 as lead workers under the earthenware and china rules in North Staffordshire. In 1906 there were 97 cases of lead poisoning; in 1907, 82 cases; in 1908, 91 cases; in 1909, 49 cases; in 1910, 63 cases; in 1911, 78 cases; in 1912, 74 cases; in 1913, 55 cases, and in 1914, 23 cases. In 1913 there were 14 deaths attributed to lead poisoning. Deaths from lead poisoning in 1914, with occupations, were: potter's miller's carter, 1; potter's dippers, 2; house painters, 2; potter's places, 3; colliery laborer (formerly color mixer), 1; occupation not stated, 1. The actual certified causes of these deaths were as follows: acute lead poisoning, brought about by his employment; chronic lead poisoning 16 years, chronic interstitial nephritis, uremic convulsions; chronic nephritis, set up by deceased working in lead as house painter; chronic nephritis, through lead poisoning accelerated by tuberculosis; primary plumbism and secondary consumption; plumbism, convulsions and heart failure; hemorrhage of the brain, set up by working in lead; chronic kidney disease, set up by deceased working in lead; meningitis, accelerated by lead poisoning and kidney disease caused by lead poisoning.

WAR NOTES

Red Cross Shipment.—The American Red Cross shipped, August 7, to the Belgian Red Cross at LaPanne, Belgium, from New York on the *Espagne*, 4,400 pounds of hospital supplies, including 400 pounds of chloroform and three cases of children's clothing.

The Minnesota Unit for Paris.—The corps of surgeons and nurses which is planning to go to Paris for a three months' term of duty at the American Ambulance, is expected to be ready to assume its duties in Paris, January 1, next, instead of April 1, as originally planned.

News From the Chicago Unit.—The Chicago unit with the British expeditionary force has been located at Etaples, France. The hospital, which is known as the Twenty-Third General Military Hospital, British expeditionary force, France, contains 1,040 beds and is thoroughly equipped. The unit went into service at the hospital on July 7 and on the first night three train loads of wounded soldiers were received. The surgical cases are mostly shrapnel wounds and compound fractures.

Mortality Among the German Wounded in the Home Hospitals.—The *Medizinische Klinik* of July 18 cites the statistics from the hospitals in the home zone showing the steady improvement in the latest results accomplished. The mortality has declined from 3 to 1.4 per cent. while the number of men discharged as able to resume their military duties has increased from 84.8 per cent. in August, 1914, to 91.2 per cent., April, 1915. The average for the nine months was respectively 1.9 and 88.5 per cent. The figures are really a little higher than this, as a number who were still disabled when leaving the hospital have resumed their places at the front since.

Exchange of Captured French and German Physicians.—The *Deutsche medizinische Wochenschrift* announces that an arrangement has been made between the German and French governments for the release at the same time of captured physicians, chaplains, pharmacists, sanitary orderlies, nurses and bearers, with the exception of those that are temporarily detained for the care of the sick, the wounded and the prisoners of their own nationality. In a previous issue the *Wochenschrift* urged the necessity at times for detaining the captured medical men and nurses as the sick and wounded have confidence in their compatriots speaking their own tongue, while this leaves the German medical force free to attend to their own people.

The Australian Medical Profession in the Army.—The *Medical Journal of Australia*, of June 26, states that about 28 per cent. of the medical profession of Australia are serving in the front at present. The requirements at present are, reenforcements for the general hospitals, convalescent depots in England, field ambulances and equipment of eighteen hospital ships with four medical officers on duty on each. It is also announced that the defense department expects to organize another general hospital. The medical profession of this great colony deserves credit for its liberal response to the request for help sent by the mother country. This reduces the proportion of physicians to population from 1:2,000 to 1:2,722.

Council on Welfare Work for the Maimed in the War.—The *Magistrat* of the city of Berlin has appointed a committee of eight to confer with the municipal authorities in regard to measures for ameliorating the condition of the maimed in war. The council consists of Professors Borchardt and Brentano (surgery); G. Klemperer and Kuttner (internal diseases); Cohn and Friedemann (orthopedics); Liepmann and L. Jacobsohn (nervous affections); Fehr (ophthalmology); Claus (ear), and Ritter (teeth).

Aid for Belgian Physicians.—The report of the treasurer of the committee of American physicians for the aid of the Belgian profession, for the week ended Aug. 7, 1915, lists the following contributions:

Marwick, Mitchell, Peat & Co., Chartered Accountants, three audits of the Treasurer's accounts, March 20, May 30 and June 20, 1915.	
Dr. E. W. Smith, Meriden, Conn.	$ 10.00
Receipts for the week ending August 7	$ 10.00
Previously reported receipts	7,769.84
Total Receipts	$7,779.84
Previously reported receipts:	
1,625 standard boxes of food at $2.20	$3,575.00
1,274 standard boxes of food at 2.30	2,930.20
353 standard boxes of food at 2.28	804.84
Total disbursements	7,310.04
Balance	$ 469.80

F. F. SIMPSON, M.D., Treasurer,
5 Jenkins Arcade Bldg., Pittsburgh.

LONDON LETTER

LONDON, July 30, 1915.

The War

THE TOTAL CASUALTIES

The total number of casualties among the British forces in all the fields of operation is now 330,995, of which 9,106 are naval and 321,889 are military. The total is made up of 61,384 killed, 196,620 wounded, and 63,885 missing. In my previous letter the casualties were given up to the end of May, and amounted to 271,616; thus, in the succeeding seven weeks, 59,379 have been added. Comparison with some previous campaigns will show the enormous scale on which life and limb are now being sacrificed. In the Crimean War the British losses were 2,755 killed and 12,094 wounded. In the Franco-German War of 1870-1871, the Germans had 17,570 killed and 96,189 wounded. In the Russo-Turkish War of 1877, the Russians lost 32,780 killed and had 71,268 wounded. In the South African War there were 5,256 killed and 26,286 wounded.

THE BRITISH MEDICAL ASSOCIATION AND THE SUPPLY OF MEDICAL MEN FOR THE ARMY

In consequence of the war, the annual scientific meeting of the British Medical Association will not be held. The annual meeting of the representatives of divisions for the discussion of medicopolitical questions is now taking place. One of the subjects considered is the supplementing of the supply of physicians for the army. A committee was formed to cooperate with the War Office to regulate the supply, and endeavor to insure that the needs of the civilian population would not be neglected. The point insisted on was that the committee should safeguard the interests of men leaving their practices and see that their civil interests suffered as little as possible.

Professional Secrecy

The unsatisfactory condition of the law in regard to professional secrecy was pointed out by me a short time ago (THE JOURNAL, March 27, 1915, p. 1088). In the case of a woman who died after criminal abortion, the judge animadverted on the fact that not one of the three physicians who attended her in succession communicated with the police. When it was known that she was likely to die, this should have been done in order that her evidence might have been taken by a magistrate. The *Lancet* in a leading article dissented from this view, and said that the keeping of a patient's secret, whether guilty or not, was a point of professional honor. All the physician should do was to endeavor to obtain the patient's consent to reveal the criminal. Moreover, a celebrated criminal judge, the late Lord Brampton, expressed a diametrically opposite opinion to the judge in the present case. In the absence of the

only effectual remedy for this chaotic state of affairs—proper legislation—an attempt has been made by medical bodies to deal with the question. The council of the British Medical Association appointed the chairman of the representative meetings, the chairman of council and the deputy chairman of the Central Ethical Committee to confer with the lord chief justice on the subject of professional secrecy. The deputation was received by the lord chief justice, the attorney-general, the public prosecutor and other legal authorities. As a result of this conference the council ascertained that the authorities desire that information should be given to them by physicians in attendance on a woman suffering from abortion produced artificially, subject to the limitations that he was of the opinion that it had been induced by a third party other than the patient, and that the patient was likely to die. The council was given to understand that whereas lawyers have an absolute privilege of protection in regard to statements made to them in their professional capacity involving matters of criminal import or otherwise, no other class of persons is accorded such legal protection by state authority or act of parliament, although in the case of ministers of religion, such protection is universally observed and recognized by custom in the courts. There is no such universally recognized protection attaching to physicians in respect of statements made to them by a patient; in fact, there is a considerable conflict of authority on the subject. The council had been advised that no obligation rests on a physician to disclose the confidences of his patient without her consent, and suggested that if the state desires to set up such an obligation, it should at the very least preface such an endeavor by affording to the practitioner protection from any legal consequences that may result from his action. Without any desire to claim the right to refuse to make such disclosures in obedience to the order of a court of justice, the council, after hearing the report of the deputation received by the lord chief justice, decided to adhere to the following resolutions which it had previously passed. 1. That the physician should not under any circumstances disclose voluntarily, without the patient's consent, information which he has obtained from that patient in the exercise of his professional duties. 2. That the state has no right to claim that an obligation rests on a physician to disclose voluntarily information which he has obtained in the exercise of his professional duties.

The subject subsequently was discussed by the representatives of divisions of the association at their annual meeting, and the attitude of the council was endorsed. The solicitor of the association said he had known members of the medical profession who had absolutely refused to divulge statements made to them. He himself had advised them to refuse to divulge the information, even to the point of being threatened with imprisonment for contempt of court. He had known cases adjourned for the purpose of allowing the medical witness to "come to his senses," as it was termed. In the end, the medical witness had not "come to his senses," and no committal had taken place. In the United States the medical profession could plead privilege in regard to the disclosure of these matters. In France it was practically an indictable offense to disclose such matters at all. The medical profession in this country stood on a quite different footing, although that ought not to be so. For himself, he thought the profession was entitled to protection. One of the representatives said that those responsible for prosecutions and for obtaining convictions in criminal cases seemed to be making a big attempt to use the medical profession as an amateur unpaid branch of the detective service. If physicians allowed themselves to be so used by the legal authorities, women would not go to them but to quacks and midwives. As a citizen he was prepared to do all he could for the conviction of criminals, but he did not intend, whatever the law might do or say in an attempt to persuade him, to betray professional confidence. He hoped that the profession would stand solid against that aggression on its rights and privileges. Thus the attempt of the British Medical Association to deal with the anomalous position of the profession by conference with the legal authorities has only made matters worse. At the conference the lord chief justice intimated that if any fresh rule were contemplated, it would be best to have this done by legislation, which, of course, is the only proper method.

The subject next came before the Royal College of Physicians, who adopted the following resolutions: 1. A moral obligation rests on every physician to respect the confidences of his patient, and without her consent he is not justified in disclosing information obtained in the course of his professional attendance on her. 2. Every physician who is convinced that criminal abortion has been practiced should urge his patient, especially when she is likely to die, to make a statement which may be taken as evidence against the person who has performed the operation, provided her chances of recovery are not thereby prejudiced. 3. In the event of her refusal, he is under no legal obligation to take further action. 4. Before taking any action which may lead to legal proceedings, a physician will be wise to obtain the best medical and legal advice, both to insure that the patient's statement may have value as legal evidence, and to safeguard his own interests, since there is no certainty that he will be protected against subsequent litigation.

Thus there is the widest divergence between the demands of the highest legal authorities and what our leading medical journal and medical bodies regard as the duty of the physician.

BERLIN LETTER

BERLIN, July 13, 1915.

Results of Treatment in the German Hospitals

In view of the appearance of a further official report dealing with the results of the treatment of the wounded at home hospitals, I wish to make some additions to my previous letter. Of each hundred soldiers dismissed from these hospitals in August, 1914, 84.8 were classified as fit for service, and 12.2 as being either unfit or given a furlough. Of the latter, a certain percentage surely will again be fit for service. Three per cent. died. For each month since then, the results estimated on the same basis are as follows:

	Fit for Service	Unfit	Died
September, 1914	88.1	9.1	2.7
October, 1914	88.9	8.7	2.4
November, 1914	87.3	10.6	2.1
December, 1914	87.8	10.5	1.7
January, 1915	88.7	9.9	1.4
February, 1915	88.6	10.0	1.3
March, 1915	88.9	9.05	1.6
April, 1915	91.2	7.4	1.4

Taking the report as a whole, the averages are as follows: fit for service, 88.5; unfit, or on furlough, 9.6; died, 1.9. Special attention should be directed to the fact that the percentage of fit for service has increased steadily, whereas the mortality percentage has decreased. In the Franco-Prussian War (1870-1871) the statistics based on the reports of all hospitals, abroad as well as at home, showed that 88.93 per cent. were returned to the front fit for service, whereas 11.07 per cent. died. The total number of wounded was 116,821, or 14.8 per cent. of the entire army. Of these wounded, 17,215, or 2.2 per cent. of the total fighting strength, died on the field of battle; 11,023, or 1.4 per cent., died later, and 88,543, or 11.2 per cent., were again made fit for duty. In the American Civil War the total number of wounded was 328,293, or 60.3 per cent. of the total fighting strength. Of this number, 44,238 (8.1 per cent.) died on the field of battle, whereas 34,849 (6.4 per cent.) died later. The percentage of those killed as contrasted with those wounded was 24.1. Of those receiving surgical care, 87.73 per cent. were restored to health, and 12.27 per cent. died. In the present war, the percentage of killed will probably be very much greater than in the previous wars because, judging from reports received, the number of wounds caused by the artillery is much greater than formerly. In the Franco-Prussian War the number of wounded, among the German troops was: by rifles, 89 per cent.; by cannon, 8.2 per cent., and a very small percentage of wounds by sidearms. Among the French troops, 70 per cent. of those killed died as a result of rifle bullets, and 25 per cent. as the result of artillery fire.

Instruction of the Deaf

The city of Berlin has made provision for the instruction of schoolchildren suffering from a high grade of incurable deafness and who, therefore, are unable to follow the routine courses of instruction. During the past few years, certain regulations have been laid down for this class of pupils which meet the medical as well as the educational requirements of the day. The scattered classes throughout the city were gathered together and placed in groups, each comprising six classes of the ordinary school. For each of these schools, a definite plan of instruction has been outlined, probably the first of its kind, to become effective next October. The principal object of these schools is to restore the social status of the deaf so that they can again mingle

with their fellows, and to give them the same educational training offered in the common schools of Berlin. These children are instructed in articulation, lip reading and audition so as to awaken in the pupil a sense of security and the consciousness that, in spite of his affliction, he can, by close application and hard work, become a useful and respected member of society. Following the example of Berlin, several other of the large cities in Germany have arranged for similar classes for the instruction of the deaf.

PARIS LETTER

PARIS, July 22, 1915.

The War

THE SOLDIER'S DIET

Professor Landouzy read a paper on this subject before the Académie de médecine. The soldier's diet seems to Landouzy to be too arbitrarily and uniformly regulated. He would especially like to see use made of natural wine, which would help in the war against alcohol. A bottle of wine represents 400 calories, costs from 30 to 40 centimes (6 to 8 cents) and replaces a quantity of meat representing the value of 2 francs (40 cents). The soldier's meat ration is amply sufficient, if not excessive. Moreover, it is indispensable that his height and weight, and the character of his duty be taken into account in establishing the proper ration for him. One would not give the same ration to a foot soldier of small stature as to a cuirassier.

THE NEUROLOGY OF WAR

The *Revue neurologique* has just devoted a special number to papers on the neurology of war: analysis of works published in French medical periodicals and a summary of the most important communications made to the principal scientific societies of France on the clinical consequences of traumatisms of the brain, the spinal cord and the nerves, psychopathic troubles connected with present events and the surgical operations and therapeutic procedures called for in such cases.

THE REPATRIATION OF THE MEMBERS OF THE MEDICAL SERVICE

Last week 600 French physicians, pharmacists and nurses arrived in Lyons by special train returning from Germany. The convoy included also an English physician, Dr. Brown, physician on board of the *Mahory*, which was torpedoed by a German submarine May 7 last at Zeebrugge. Dr. Lapasset, director of the medical service of the region, received the captives in the name of the government.

CLASSIFICATION OF WOUNDS AND INFIRMITIES ENTITLING THE SUBJECT TO RETIREMENT PENSION OR TO TEMPORARY RELIEF

According to the law with regard to military pensions, the right to a retiring pension depends on (1) the incurability of the wounds or infirmities, and (2) such a serious degree of the wounds or infirmities that the patient is unable to earn his subsistence, his capacity for work being reduced at least 60 per cent. But in addition to such incurable lesions, there are many others which are susceptible of ultimate improvement and which are not covered by the regulations in force. Hence the physicians whose duty it is to pass on applications for a pension have either to ignore their natural sentiments of humanity or to fail in making a strict application of the rules. A recent decree has modified conditions by instituting eight classes of relief pensions corresponding to reductions in the capacity for work equal to 10, 20, 30, 40, 50, 60, 80 and 100 per cent. of the normal capacity. Thus, infirmities, the incurability of which is not medically certain at the time of examination, will be compensated in a more equitable manner. In cases of serious functional troubles which may improve with time, experts will no longer be tempted to give an irrevocable pension prematurely, since, in the graduated series of relief pensions, they can find degrees corresponding to the various grades of incapacity. Hereafter the immediate consequences of fractures, nervous or articular lesions, the serious functional troubles of traumatic hysteria and the curable cases of tuberculosis can be given equitable compensation without irrevocably involving the future and, on the other hand, without compelling the experts, as formerly, to compensate a temporarily considerable degree of probably curable functional incapacity by an insufficient indemnity corresponding to a maximum reduction of 30 per cent. of the capacity for work, the highest grade of the renewable relief pensions under the old regulations.

The scale of valuation of the seriousness of wounds and infirmities has not yet been published. Meanwhile, the medical experts are invited to refer as much as possible, for a scale of reduction of earning capacity, to the figures established under the law of 1898 on industrial accidents. The military legislation, unlike the civil legislation, however, takes no account of professions.

Incurable wounds or diseases may justify either the retirement pension or the permanent relief pension according to the degree of seriousness. Infirmities regarded as definitely incurable which produce a reduction of earning capacity amounting to from 60 to 100 per cent. are the only ones which entitle the sufferer to the retirement pension. Infirmities regarded as definitely incurable but entailing a reduction of earning capacity of from 10 to 50 per cent., on the other hand, justify the granting only of a permanent relief pension.

For infirmities which do not seem to be incurable, relief pensions are awarded for two years, and may be repeatedly renewed for the same period.

The following is the scale of renewable relief pensions in francs for European soldiers (smaller sums are awarded for the soldiers of Algeria-Tunis, Indo-China, Madagascar and East Africa):

Grades	Degree of Incapacity (Per Cent. of Reduction)							
	1st (100%)	2d (80%)	3d (60%)	4th (50%)	5th (40%)	6th (30%)	7th (20%)	8th (10%)
Chief Adjutant	1,800	1,400	1,100	910	730	550	368	184
Adjutant	1,690	1,300	1,000	832	666	500	334	168
Aspirant	1,625	1,250	950	791	633	475	318	159
Sergeant-Major	1,560	1,200	900	750	600	450	300	150
Sergeant	1,430	1,100	800	666	533	400	268	134
Corporal	1,170	900	700	582	466	350	234	118
Soldier	975	750	600	500	400	300	200	100

A THESIS PRESENTED DURING WAR TIME

A rather uncommon occurrence was the presentation before the Faculté de médecine de Paris a few days ago, by M. Perrin of Grenoble, of his thesis for the doctor's degree. The young candidate, who was an auxiliary physician in an infantry regiment, had been decorated with the military medal and the cross of war, having received honorable mention in the order of the day. Professor Landouzy, dean of the Faculté de médecine, although he was not on the jury, put on his professorial red robe to do honor to the candidate. "I have taken my place with my colleagues," he said to the candidate, "less to congratulate you on your worth than to do honor in your person to all the French physicians, great and small, who, on the firing line, in the ambulances and in the hospitals, are doing their duty so valiantly. . . . In 1870, peril lurked in the hospital for us because the admirable discoveries of science had not yet given us the means of averting epidemics of typhus, typhoid fever and cholera. It is in the first-aid posts and in the trenches that you are exposed, and unfortunately the tribute that you pay is no less than that of other days. From the plains of the Yser to the crests of the Vosges, sixty young auxiliary physicians have already fallen, and almost 1,000 military physicians have sacrificed their lives to our ideal of peace and liberty."

It is interesting to note that the subject of Dr. Perrin's thesis was the treatment of wounds of the thigh; he himself had been wounded in the thigh by many fragments of a *grosse marmite*. As he had been cared for at the American hospital at Neuilly, Professor Hartmann, who was a member of the jury, took occasion to speak in praise of this establishment, where American surgeons have rendered such great services to the wounded of France.

THE FRENCH RELIEF FUND AND THE "JOURNÉE FRANÇAISE" IN ENGLAND

For several months the French Relief Fund has cooperated with our Comité du Secours National in relieving the distress of civilian victims of the war, and has already expended several hundred thousand francs. In order to render still more efficacious aid, on the French national holiday there was organized in England a celebration of the "day of the French flag." The amount of the receipts is not yet known exactly, but for London alone it amounts to 750,000 francs ($150,000).

PROHIBITION OF ALCOHOLIC DRINKS IN THE ARMY

An order of General Galliéni, military governor of Paris, forbidding the sale of alcoholic drinks to soldiers garrisoning the defenses of Paris, has just been published. Now when the physical and moral energy of soldiers ought to be carried to their highest degree of intensity, the order

explains, it is important that the campaign against alcohol, which destroys both, should be carried on without faltering. Hence it is forbidden to sell alcohol and alcoholic drinks (absinthe, vermuth, bitters, apéritifs, liqueurs, etc.) to soldiers of any grades. Liquor sellers will have their establishments closed temporarily for the first offense and permanently for the second offense.

DEATH OF DR. CHAILLOU

Dr. Chaillou of the Pasteur Institute of Paris, one of the most distinguished collaborators of Dr. Roux, has just met a glorious death on the field of battle. He was the head of an army corps ambulance and has been mentioned in an order of the day in the following terms: "He requested and obtained the perilous commission of policing (rendering sanitary) a battlefield near the trenches of the enemy. He was killed during the night while he was accomplishing his mission."

The Academy of Medicine and the Campaign Against Alcoholism

In its session of July 13, the Académie de médecine adopted the conclusions of the report of Prof. Gilbert Ballet on the measures to be taken against alcoholism: (1) prohibition of the sale of brandies containing more than 50 per cent. of alcohol by volume; (2) prohibition of the manufacture, the circulation and the sale of all liqueurs and aromatic wines containing more than 23 per cent. of alcohol (such drinks ought not to contain, moreover, more than 0.5 gm. of essence per liter; still liqueurs containing more than 300 gm. of sugar per liter may be tolerated up to 30 per cent. of alcohol, since this clause concerns especially apéritifs, and liqueurs or dessert wines); (3) prohibition of the employment, in giving aroma to spirituous drinks, of chemical products, plants or essences including among their normal constituents thujone (essence of absinthe), benzoic aldehyd and salicylic ether and aldehyd; (4) establishment of a high surtax on every drink, whatever its nature, which exceeds 15 per cent. of alcohol.

The academy, moreover, expressed the hope that, while awaiting legislation to reduce the number of drinking places, the public authorities will take the necessary police measures to close the very numerous clandestine drinking places which exist. Finally, the academy passed the resolution introduced by Dr. Vaillard, medical inspector-general of the army, that the order prohibiting the sale of alcohol in the army zone be continued and, if necessary, strengthened.

Marriages

FELIX ARNOLD IRMEN, M.D., U. S. I. S., Randlett, Utah, to Miss Anna Louise Holmberg of Washington, D. C., at Denver, June 7.

PRESLY E. WERLEIN, M.D., Mountain View, San José, Calif., to Miss Sarah Louise Richard of Melville, La., at San José, July 21.

MORRIS D. COHEN, M.D., Bisbee, Ariz., to Miss Harriet Helen Schwarz of Rochester, N. Y., at El Paso, Tex., July 25.

INGLIS FOLGER FROST, M.D., Miraj, India, to Miss Barbara Brewster of New York City, at Oyster Bay, L. I., July 28.

FRANCIS BERNARD HART, M.D., Jamaica, L. I., to Miss Natalie Theodora Howard of Brooklyn, Dec. 14, 1914.

HERBERT EMILE CHAUVIN, M.D., to Miss Gladys Eulalie Ross, both of Brentwood, L. I., N. Y., July 22.

ESSEX SYLVESTER CRAVEN, M.D., Port Arthur, Tex., to Miss Ruby C. Lawrence of Palestine, Tex., July 28.

JOHN LEWIS RIGGLES, M.D., to Miss Caroline Naomi Honodel, both of Washington, D. C., June 30.

WILLIAM HAROLD CADMUS, M.D., to Miss Emma Josephine Rogers, both of Rochester, N. Y., August 2.

WALTER C. TAYLOR, M.D., Springfield, Ohio, to Miss Rena Loise Snyder of Wyoming, Ohio, July 27.

HERBERT HARLAN HARRIS, M.D., Anderson, S. C., to Miss Nelle Smith of Beardstown, Ill., July 24.

FRANK EUGENE BALDWIN, M.D., Peoria, Ill., to Miss Margaret Lockwood of Chicago, July 28.

THOMAS A. JUDGE, M.D., Milwaukee, Wis., to Miss Florence Wagner of Mitchell, S. D., July 26.

GEORGE A. DOWNS, M.D., to Miss Marie Selling, both of Spokane, Wash., July 24.

Deaths

Olin Frisbie Harvey, M.D. University of Pennsylvania, Philadelphia, 1873; aged 68; a Fellow of the American Medical Association; once president of the Luzerne County Medical Society and vice president of the Lehigh Valley Medical Association; consulting surgeon to Mercy Hospital, Wilkes-Barre, Pa.; surgeon and obstetrician to the Wilkes-Barre City Hospital and trustee of the Danville (Pa.) State Hospital; for ten years major and surgeon of the Ninth Infantry, Pa. N. G., retiring in 1891; during the Spanish-American War, examining surgeon for the Army; from 1876 to 1880, physician to the Luzerne County Prison; for six years a member, one year president and two years secretary of the Wilkes-Barre Board of Education; died at his summer home at Harvey's Lake, Pa., July 25.

David Streett, M.D. College of Physicians and Surgeons, Baltimore, 1878; aged 60; a Fellow of the American Medical Association; president of the Medical and Surgical Society of Baltimore and Baltimore Medical Society, and vice president of the Medical and Chirurgical Faculty of Maryland; professor of principles and practice of medicine in the University of Maryland, Baltimore, and dean of the Baltimore Medical College for twenty-five years until its merger; formerly a trustee of the Maryland General Hospital; died in St. Agnes' Hospital, Baltimore, July 30, after an operation for disease of the intestines.

Thomas Lyon Hazzard, M.D. University of Pennsylvania, Philadelphia, 1881; aged 60; a member of the Medical Society of the State of Pennsylvania, Association of Military Surgeons of the United States and of the American Proctologic Society; professor of proctology in the University of Pittsburgh; rectal surgeon to the Allegheny General Hospital; formerly major surgeon of the Eighteenth Infantry, Pa. N. G., and for several years police surgeon of Allegheny; died at his home in Northside, Pittsburgh, July 29, from heart disease.

Frederick Duvall Caruthers, M.D. University of Maryland, Baltimore, 1892; aged 44; formerly a Fellow of the American Medical Association; formerly professor of genito-urinary surgery in the Maryland Medical College; visiting surgeon to the Franklin Square Hospital, Baltimore; at one time assistant physician to the Spring Grove State Hospital; resident physician at Bay View Asylum and coroner of the northeastern district of Baltimore; died at his home, July 27, from disease of the stomach.

B. E. Ward (license, Oklahoma, act of 1908), aged 66; of Purdy, Okla.; who had been under treatment in the State Hospital, Norman, until three years ago, and who, while insane, killed his wife, was taken from the Cleveland County Jail at Norman, May 9, by twelve masked men and hanged to a tree two miles south of Norman.

Beverly Stephen Nourse, M.D. Cooper Medical College, San Francisco, 1896; aged 48; for several years physician to the State Prison, Folsom, Calif.; and later local physician at San Francisco and Sacramento for the Southern Pacific System; died at the home of his uncle in Sacramento, July 23, from cerebral hemorrhage.

Charles L. Kinnaman, M.D. University of Wooster, Ohio, 1878; aged 63; a member of the Cleveland Academy of Medicine; formerly physician to Wayne County, Ohio; for many years local surgeon of the New York, Pennsylvania and Ohio Road at New Salem, Ohio; died at the home of his daughter in Cleveland, July 24.

Arthur A. McClendon, M.D. University of Louisville, Ky., 1893; Tulane University, New Orleans, 1898; aged 44; a Fellow of the American Medical Association and a member of the Mississippi Valley Medical Association; local surgeon of the Iron Mountain System at Marianna, Ark.; died at his home in Marianna, July 24.

Charles A. Crampton, M.D. George Washington University, Washington, 1884; formerly chief of the Division of Chemistry in the Internal Revenue Bureau of the Treasury Department, Washington, D. C.; and later a resident of Somerset, Md.; died in the George Washington Hospital, Washington, July 26.

Aloysius J. Driessel, M.D. Wisconsin College of Physicians and Surgeons, Milwaukee, 1906; aged 33; a member of the State Medical Society of Wisconsin and for five years a practitioner of West Bend, Wis.; died in the Riverside Sanitarium, Milwaukee, July 27, from cerebral hemorrhage.

Columbus D. Bonner, M.D. Western Reserve University, Cleveland, 1888; aged 57; for many years a practitioner of Union County, Ohio, but for the last four months a resident of Waldo, Ohio; died in the Protestant Hospital, Columbus, July 24, a day after an operation for intestinal obstruction.

Robert Allison Brown, M.D. Missouri Medical College, St. Louis, 1876; Bellevue Hospital Medical College, 1883; Medical College of Ohio, Cincinnati, 1884; aged 58; a member of the Illinois State Medical Society; died at his home in Humrick, Ill., July 21, from nephritis.

Charles Francis Preston Burchmore, M.D. College of Physicians and Surgeons, Boston, 1893; aged 56; surgeon to the Suffolk Hospital and Dispensary, Boston, and surgeon to the Ancient and Honorable Artillery Company of Boston; died at his home in Winthrop, Mass., July 27.

Samuel Henry Melcher, M.D. Dartmouth Medical School, Hanover, N. H., 1851; aged 86; for many years a resident of Chicago; surgeon with the rank of colonel during the Civil War; blind for twenty years; died at the home of his daughter in Chicago, August 1.

Charles A. Sternberg, M.D. Bellevue Hospital Medical College, 1884; aged 54; a member of the Medical Society of the State of New York; for two years city physician of Gloversville, N. Y.; died at his home in that place, July 28, from cerebral hemorrhage.

James Goldlust, M.D. New York University, New York City, 1894; aged 48; a member of the Medical Society of the State of New York and physician to the Mt. Sinai Dispensary; a pianist of marked ability; died at his home in New York City, July 27.

William Roy Elgin, M.D. Hospital College of Medicine, Louisville, 1904; aged 33; local physician of the Yazoo and Mississippi Valley Railroad at Ruleville, Miss.; fell from a window of the Monteleone Hotel, New Orleans, July 26, and was instantly killed.

Charles Harvey Shattuck, M.D. Dartmouth Medical School, Hanover, N. H., 1881; aged 57; who owned and conducted several drug stores in Everett, Andover and Ballardvale, Mass.; died at his home in Malden, Mass., July 26.

Amos Carroll Conley, M.D. Medical School of the Valley of Virginia, Winchester, Va., 1858; aged 76; formerly of Boone, Iowa, but of late years a resident of Tunnelton, W. Va.; died at his home, April 1, from chronic bronchitis.

Samuel Harvey Wollerton, M.D. University of Pennsylvania, Philadelphia, 1880; aged 55; for twenty-five years a practitioner of New York City; died at the home of his brother in Scranton, Pa., July 26, from pneumonia.

Cortland Kierman Hand, M.D. College of Physicians and Surgeons in the City of New York, 1914; aged 24; an intern in St. Vincent's Hospital, New York City; died at his home in Mt. Vernon, N. Y., July 30, from heart disease.

George Washington Reichard, M.D. Eclectic Medical Institute, Cincinnati, 1878; aged 61; a member of the Ohio State Medical Association; died at his home in Springfield, Ohio, July 27, from cerebral hemorrhage.

Adolfo Martinallo, M.D. Royal University of Turin, Italy, 1900; aged 39; for ten years a practitioner of Butte, Mont.; a lieutenant in the medical corps of the Italian army; died in Vico, Italy, early in July.

Frank Hanson Harrison, M.D. College of Physicians and Surgeons in the City of New York, 1882; aged 60; of New York City; died in Bellevue Hospital, New York City, July 23, from tuberculosis.

William Hampton Price (license, North Carolina), aged 50; a practitioner of North Carolina for thirty years; died at his home in Matthews, July 19, from disease of the throat.

Edward Sumners, M.D. Hahnemann Medical College, Chicago, 1904; aged 37; died at his home in Shirley, Ill., July 16, from cerebral hemorrhage.

Andrew Krumling (license, Michigan, years of practice, 1900), aged 77; of Blissfield, Mich.; died in the Kalamazoo State Hospital, July 23.

John M. Heinimann, M.D. University of California, San Francisco, 1877; aged 59; died at his home in Fruitvale, Calif., July 21.

William M. Bryant, M.D. Jefferson Medical College, 1858; aged 79; died at his home in Canton Bend, Wilcox, Ala., March 22.

Azro Patterson Willits (license, Illinois, 1881), aged 65; died at his home in Keithsburg, Ill., July 17.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

ARTICLES REFUSED RECOGNITION

Report of the Council on Pharmacy and Chemistry

Below appear abstracts of the Council's actions on articles refused recognition which were not deemed of sufficient importance to require lengthy reports.

Uricsol

Uricsol is marketed by the Uricsol Chemical Company, formerly of Los Angeles, now of Boston. Regarding its composition only vague statements are made. In an advertising pamphlet it is promised that the formula will be sent to physicians on request. Such a request from a physician elicited the following statement:

"URICSOL is a non-irritating, alkaline solution, containing Lithium Citrate, Acid Citric and Potassium Nitrate, together with a saline laxative in the form of Glycero Sodium Phosphate, with Vegetable Tonics added."

The Association Laboratory has made an examination of Uricsol to determine its composition and reports as follows:

LABORATORY REPORT

A trade package purchased in March, 1915, from a wholesale drug house was labeled:

"Uricsol Rheumatic Remedy, Uric Acid Solvent, Kidney and Liver Stimulant, Manufactured by the Uricsol Chemical Co., Los Angeles, Cal."

This package was wrapped in a circular entitled "The Great California Remedy—Uricsol." The preparation is a viscid, slightly turbid light brown liquid, with a faintly aromatic odor and a salty, bitter taste. The diluted solution is acid in reaction toward litmus and phenolphthalein and alkaline toward methyl orange.

Qualitative tests showed a presence of phosphate, citrate, nitrate, sodium, glycerin, and a small amount of lithium in aqueous solution. Besides these a small amount of some organic, nonalkaloidal substance was found, which from its bitter taste suggested gentian. From the qualitative tests it appeared that the phosphate was the predominating ingredient and accordingly a phosphate determination was made. The results, calculated to sodium phosphate, U. S. P., indicated the presence of 64.20 gm. per 100 c.c., held in solution by citric acid and sodium nitrate.

Uricsol evidently is a solution containing a large amount of sodium phosphate with small amounts of lithium, nitrate, citric acid and glycerin with probably some vegetable extract.

In general Uricsol is similar to the once widely exploited proprietary "Melachol," which has been frequently imitated. A preparation, essentially identical, is in the United States Pharmacopeia, under the title "Compound Solution of Sodium Phosphate."

The Uricsol Chemical Company calls its preparation

" . . . the latest word in the treatment of Rheumatism and that allied group of ailments which is caused by an excess of Uric Acid."

Hay fever, bronchial asthma and neuritis are conditions in which it is recommended. The claim is made that

"Uricsol quickly controls Vasomotor Rhinitis and eliminates such conditions from the system." "In fact, it will correct FAULTY METABOLISM."

To a few practitioners of an older generation the pharmacologic basis of a remedy for rheumatism was sufficiently defined by saying that it increased the solubility of uric acid or affected it in some way. This theory is obsolete; there is not, and never was, any reliable evidence on which to base the theory that rheumatism is in any way caused by uric acid. The exploitation of Uricsol as a "uric acid solvent" is merely another illustration of the way in which nostrum manufacturers play on disproved theories. Of course the claim that sodium phosphate has any particular

power to control vasomotor rhinitis, hay fever, asthma, and to correct faulty metabolism is foolish.

To summarize: Uricsol is a mixture of well-known drugs marketed with false claims as to therapeutic action, with misleading and meaningless statements as to composition and under a name which invites uncritical prescribing. Uricsol is held ineligible to inclusion in New and Nonofficial Remedies.

Duodenin, Armour

Duodenin, Armour (Armour & Co., Chicago), supplied in 1 grain and 2 grain tablets, is said to be prepared from the glandular or epithelial layer and mucous lining of the hog duodenum and to contain the maximum amount of secretin and enterokinase in stable form. Armour & Co. claim that the secretin in Duodenin has not been submitted to boiling or precipitation processes or otherwise exposed to possible changes by hydrolysis, and that the administration of the combination of secretin and enterokinase found in Duodenin, Armour, increases the flow of pancreatic juices and at the same time activates the proteolytic enzyme to a maximum. This claim is based on the hypothesis that gastric digestion does not destroy the secretin and enterokinase said to be present in the preparation. The following recommendations for use are made:

"Duodenin (Armour) is recommended in the treatment of intestinal disorders where an increased flow of pancreatic, hepatic and intestinal secretion is desired. It is of specific value in proteid digestion on the theory that secretin and enterokinase stimulate the pancreas and activate its secretion."

Discussing the claims the referee of the Committee on Pharmacology reported to the Council that apparently no investigations have ever shown the existence of conditions in which there is an absence or an insufficient amount of enterokinase and that the existence of such conditions is improbable. He reported further that all adequately controlled physiologic experiments so far reported show (Starling, Matsuo) that pancreatic secretin given by mouth or directly into the intestine, is not absorbed in active form, and that no evidence is available to show that conditions exist in which there is a deficiency of secretin or enterokinase. He held that Duodenin, Armour, should not be considered further until evidence has been submitted to show that there are conditions in which secretin or enterokinase is absent and that these substances may be utilized by the organism if administered. As all that is known concerning these hormones tends to discredit the assumption that their administration is of use, he recommended that in the absence of any scientific evidence of its therapeutic value, Duodenin, Armour, be not admitted to New and Nonofficial Remedies.

The Council adopted the report of the referee.

Jubol

The following ridiculous statements are addressed, not to the laity, but to the medical profession:

DO YOU SUFFER FROM Constipation—Hemorrhoids—Enteritis—Mucous discharge — Pituita — Acidity of the stomach—Vertigo — Sick Headache — Disturbed Sleep — Insomnia —Sallow Complexion— Coated Tongue— Offensive breath— Fatigue and depression — Boils — Pimples?

"ONE of these symptoms alone shows that there is defective or insufficient function of the intestines, even if the stools are regular.

"Excrements remain too long in the intestine and set up fermentation. The harmful poisons and ptomains which they produce are re-absorbed by the blood and poison the whole system.

"The Intestines must be cleared and re-educated with JUBOL.

"Jubolise your Intestines."

Jubol tablets are sold in the United States by Geo. J. Wallau, Inc., New York, and are said to be prepared by J. L. Chatelain, Paris, France. The following incomplete and nonquantitative "formula" is furnished:

". . . compounded chiefly [!] of Agar-Agar, Biliary Extracts and pure Extracts from all the intestinal Glands."

It is asserted that

"The tablets are coated with a protective covering in order that they may act on the intestine only."

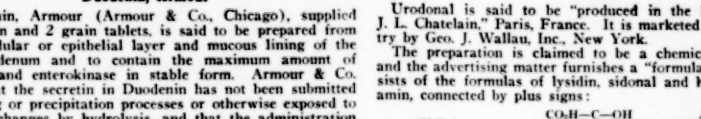
The tablets contained in a regular-size trade package, obtained direct from the agent, readily separated into two halves and disintegrated within a few minutes when agitated with water. It is thus evident that, under ordinary conditions, the intestinal ferments in Jubol (if they are present, as claimed) would be destroyed during their passage through the stomach. In direct tests, however, practically no tryptic activity was demonstrated.

The composition of Jubol is not declared; grossly unwarranted and incorrect claims are made for its therapeutic actions; the name does not indicate the alleged ingredients and so much of the composition as is declared indicates an unscientific mixture. The Council decided that Jubol should be held ineligible for New and Nonofficial Remedies, and that this report should be published.

Urodonal

Urodonal is said to be "produced in the laboratory of J. L. Chatelain," Paris, France. It is marketed in this country by Geo. J. Wallau, Inc., New York.

The preparation is claimed to be a chemical compound, and the advertising matter furnishes a "formula," which consists of the formulas of lysidin, sidonal and hexamethylenamin, connected by plus signs:



That the substance is a chemical compound is highly improbable, and no evidence has been submitted to substantiate the claim. On the contrary, in the following statement the phrase "based on" is a virtual admission that the preparation is merely a mixture:

"Urodonal . . . is a granular effervescent preparation based on methylglyoxalidine [Lysidine], quinate of diethylene-diamine [Sidonal] and hexamethylene-tetramine [Formin, urotropine]."

Mystery is added by the mention of undefined "special products" in the following:

"The fact of combining these two salts [lysidin and sidonal] in Urodonal, in strictly determined proportions and in the presence of special products, gives this preparation very considerable power in dissolving uric acid."

These contradictory statements of composition conflict with Rule 1.

Urodonal is marketed in typical "patent medicine" style: the name "Urodonal" is blown in the bottle and the label contains a list of "Indications," including rheumatism, gout and gravel (Rule 4). That this form of marketing has introduced it to the public is suggested by the following in an advertising circular:

". . . Urodonal is now popular—even classic—throughout the world, where thousands of doctors and millions of patients agree in asserting that 'Urodonal is to rheumatism what quinine is to fever.'"

There are also other indications that the mixture is to be exploited to the laity. For instance, the U. S. distributor sends out a portrait of Sarah Bernhardt bearing the legend:

"I am positive that URODONAL preserves youth's freshness with clearness and strength to brain and heart. I have taken it for two years with the greatest benefit. Sarah Bernhardt."

A circular advises this mixture

"For all who suffer from Arthritis, Rheumatism, Arterio-Sclerosis, Renal and Bilious Lithiasis, Headache, Gout, Gravel, Lumbago, Sciatic Pains, Neuralgia and all uric acid troubles."

"In fact, Urodonal is five times more active than piperazine, and thirty-seven times more active than lithia. We are, therefore, entitled to say that no other eliminator of uric acid can be compared with it."

"Being *37 times more active than lithia*, it clears the heart valves of any sandy substances which may clog them, and checks the atheromatous degeneration of the blood vessels."

These extracts indicate sufficiently the extravagant tone of the advertising (Rule 6): None of the ingredients are notably active in dissolving uric acid when administered by mouth. None produce any marked increase of uric acid elimination. No intelligent physician would use a uric acid solvent for "bilious lithiasis"; and their usefulness in the other conditions is open to doubt, to put it mildly.

Although the preparation is a simple mixture, the name does not indicate the components, but inclines to therapeutic suggestion (Rule 8).

Nothing is to be gained by combining several drugs which are useless, severally, for the purpose intended, as in the present case (Rule 10).

Urodonal is marketed under inconsistent statements of composition and with exaggerated therapeutic claims; the name is nondescriptive and the mixture is unscientific. The Council decided that the preparation should be declared ineligible for conflict with Rules 1, 4, 6, 8 and 10 and that this report should be published.

OIL-OF-SALT

A "First-Aid" Fraud

C. A. Mosso, 2253 Warren Avenue, Chicago, exploits a nostrum "Oil-of-Salt," claimed to be "a product of salt and oils" and an "infallible destroyer of all systemic poisons." "We have always been careful," says Mosso, "not to give the impression that Mosso's Oil-of-Salt is in any manner a product of drugs or chemicals."

Mosso's philosophy of health and disease is a simple one: All diseases are but "systemic poisons" in the body: Oil-of-Salt destroys all poisons; *ergo*, Oil-of-Salt cures all diseases.

"All of our ailments are caused from some poison contracted in devious ways. . . ."

"Mosso's Oil-of-Salt will remove any and all kinds of systemic poison from the human body . . . and when this is done perfect health is the natural result."

"Mosso's Oil-of-Salt is proclaimed to be the most wonderful curative agency known. . . ."

Mosso's conception of physiology, anatomy and pathology is in keeping with his knowledge of pharmacology. Diabetes, he tells us, is "commonly called Bright's disease," while "a formation of stone or calculus substance" comprises "what is known as gravel or Gall Stones."

"Hay-fever, Rheumatism, Neuralgia, Skin troubles such as Salt-rheum, Eczema, Pimples, etc. Piles of all kinds, Indigestion, Diarrhea, Nervousness, Female Weakness and prostatic trouble; all of which can be restored to perfect order by the use of Mosso's Oil-of-Salt."

The favorite method of introducing this fraudulent nostrum seems to be that of sending to those in charge of manufacturing plants a printed letter reading, in part, as follows:

"*Gentlemen:*—If you will allow me to place in the hands of your First Aid Department my system in the line of a First Aid to the Injured, I will guarantee that no workman need lay idle for over thirty minutes, after the treatment has been applied, from any of the ordinary accidents that occur in their daily work, also that they will not suffer from any pain after said time, and there will never be any bad effects from the wounds.

"The wounds I speak of are as follows: Cuts, Burns, Strains, Crushed Feet and Hands, also all Poisonous Wounds as those caused from Rusty Nails, Copper, Brass, Lead, Zinc, etc. No Blood Poison can ever take place in any case where The First Aid is used.

"You need have no fear of death from the following troubles, and relief can be obtained in from thirty to sixty minutes, namely: Ptomaine Poisoning, Internal Hemorrhage of any kind, Colic, Bloody Disentary [*sic*] and all dangerous afflictions that assail mankind in their daily life."

Photographic reproductions of the labels of "Mosso's Oil-of-Salt" and of "First-Aid Treatment" which is said to be the later name of the Mosso fraud.

One would imagine that it would not take medical knowledge to recognize the absurdity and fraudulence of the claims made in this letter. Apparently, however, factory foremen and superintendents are not infrequently misled by the specious promises made for this product. Several manufacturing concerns have written to THE JOURNAL asking for information regarding the composition and probable value of Mosso's Oil-of-Salt and, as a result, an analysis was made of the preparation. The chemists' report from the laboratory of the American Medical Association follows:

CHEMISTS' REPORT

Mosso's Oil-of-Salt is a yellow oily mixture possessing an aromatic odor, resembling a mixture of turpentine, camphor and sassafras, and possessing a strong burning taste. It is inflammable, and burns with a luminous smoky flame.

When distilled with steam it leaves a yellow oily liquid devoid of aromatic odor, but possessing an odor and taste indicating linseed oil. Qualitative tests and the iodin absorption number further identify the oil as linseed oil. The volatile portion which was carried over by the steam was a colorless oily mixture and possessed the same characteristic odor as Oil-of-Salt. This mixture was completely volatile on the steam bath and was inflammable.

Quantitatively the linseed oil was determined by removing the volatile constituents by steam, and extracting the linseed oil by chloroform and evaporating the chloroformic solution in a weighed dish. After evaporation of the chloroform the oil was allowed to dry in a desiccator. After a short time the weight began to increase, this no doubt being due to oxidation. The weight of oil found by this method may be taken as a close approximation of the actual content of oil; the presence of about 63 per cent. linseed oil was indicated. By heating a weighed sample of Oil-of-Salt on a boiling water-bath until the characteristic aromatic odor of the preparation had disappeared a residue amounting to 64.5 per cent. was left. This approximate determination indicates the non-volatile oil (linseed) content to be about 63 to 64 per cent.

An aqueous extract of Oil-of-Salt is acid in reaction to litmus, methyl orange, phenolphthalein and dimethylaminoazobenzene and contains chlorid, showing the presence of free hydrochloric acid. A portion was extracted with water until the extracts no longer were acid to methyl orange and the combined extract titrated with normal alkali. This showed the presence of 0.16 per cent. free hydrochloric acid. After titration the solution was made acid by nitric acid and the chlorid precipitated as silver chlorid. By this method a chlorid content equivalent to 0.17 per cent. hydrochloric acid was indicated. An alcoholic solution of Oil-of-Salt titrated with normal alkali in the presence of phenolphthalein indicator showed the presence of 0.17 per cent. free hydrochloric acid.

These determinations agree as to the free hydrochloric acid content. A total chlorid determination made after fusing with Hunter's fusion mixture showed a chlorid content of 0.51 per cent. equivalent to 0.52 per cent. hydrochloric acid. An alcoholic extract of Oil-of-Salt, made until evaporation of some of the alcohol showed no more of the volatile oils, was fused with Hunter's mixture and the chlorid determined; 0.489 chlorid equivalent to 0.49 per cent. hydrochloric acid was found. This compared with the total chlorid content indicates that the part of the mixture containing the chlorid is soluble in alcohol, viz., the volatile oils.

In general it may be concluded that Oil-of-Salt is a mixture consisting of about ⅔ linseed oil with ⅓ of a mixture of essential oils including turpentine, camphor and sassafras, containing total chlorids equivalent to 0.52 per cent. hydrochloric acid, ⅓ of which is present as free hydrochloric acid.

Here, again, we have illustrated the reason for the frantic opposition on the part of "patent medicine" manufacturers to every demand for publicity of composition. The most ignorant of workmen could hardly be fooled into believing that a mixture of linseed oil with small amounts of oils of turpentine, camphor and sassafras, a pinch of salt and a trace of muriatic acid could produce the results that Mosso claims for his "Oil-of-Salt." No intelligent human being, in fact, could be convinced that such a mixture would "place you and those you employ beyond all danger or premature Death and Suffering from any of the accidents that occur in your works." With the mystery that surrounds a secret mixture like Oil-of-Salt, however, any claim, no matter how preposterous will be accepted by a certain number of people. After carefully analyzing the product and considering the claims made for it, the verdict must be that Mosso's Oil-of-Salt is an impudent fraud.

The latest information regarding Oil-of-Salt indicates that it is being exploited under the name, "First Aid Treatment," and sold by the Pan-Alert Laboratories, 607 Marquette Building, Chicago.

Correspondence

Serbian Appreciation of American Assistance — Conditions in Southwest Macedonia

To the Editor:—The enclosed translation of an editorial in the Monastir *Daily Press* of July 6, 1915, may be of interest to your readers. The article is of value in the fact that it shows the appreciation of the Serbians of American assistance. It is of little value for the estimate it has placed on the work of myself and colleagues. It does us far too much credit. The warm weather has done much more toward eradicating typhus than our own efforts. Incidentally, typhus is well under control and does not exist in more than half a dozen places in Serbia, and in these places not to an alarming extent.

Enclosed also are memoranda of a report of conditions among the inhabitants of Southwest Macedonia.

B. W. CALDWELL, M.D., Bitolji (Monastir), Serbia.

[COMMENT.—Dr. B. W. Caldwell is the hospital administrator connected with the American Red Cross Sanitary Commission in Serbia. He was formerly superintendent of the Santo Tomas Hospital, Ancon, C. Z., and went to Serbia with the commission which was headed by Dr. Richard P. Strong. The following are the enclosures, the first being the editorial referred to, and the second, a communication describing conditions in Southwest Macedonia. Bitolji (Monastir), Serbia, which under the Turkish régime was the second city of Macedonia, with 80,000 inhabitants, has since the Balkan Wars diminished to about 40,000.—Ed.]

SERBIA AND AMERICA

Among the many benefits which the present war has brought to Serbia, one of the chief is the sympathy and friendship of the cultured nations, great as well as small.

This sympathy and this friendship, together with the very manifest friendship of the glorious French nation and the traditional protection and support of great and powerful Russia, form the surest guarantee of the future of that Greater Serbia whose formation is only a question of time.

Never has Serbia experienced such great manifestation of sympathy among the allied powers as today, such praise of the unexampled bravery of her armies, the wise policy of her statesmen, and the justice of her administration. The numerous offers of moral and material support tendered to Serbia from the beginning of the war to the present, by both her allies and the ever-ready neutral powers, are the best evidence of this.

Of the neutral nations which, during the latter part of last year, beginning immediately after the defeat of the Austrian army, hastened at once to the aid of our heroes and refugees, among the first was (we acknowledge this with especial satisfaction) the great and renowned American nation.

It is known to every one how many and how great have been the services rendered by the first American Mission to our wounded and how it has served us with financial aid as well as with sanitary materials and field supplies even up to the present time.

As we write this there are found in Serbia several American units which are working as earnestly and conscientiously for the improvement of health conditions as though for their own native land.

One of these units came to Bitolji (Monastir) about six weeks ago under the leadership of Dr. Caldwell. The remaining members of the unit are Dr. Schmidt, Colonel Gayle and Engineer Hazelhurst.

Immediately on the arrival of the unit, they opened a dispensary where the poor of the city are examined and treated free of cost, which is an interminable boon to the people of Bitolji.

At the same time, the capable and energetic Dr. Caldwell has undertaken the cleaning of the city so that for the first time Bitolji is without typhus and malaria. The devotion and energy which Dr. Caldwell and his colleagues have brought to bear on this work is marvelous, and we deem it a duty and a privilege to make public acknowledgment of these facts and to express to Dr. Caldwell and his colleagues our gratitude for their conscientious and beneficial work, and at the same time beg that these, our feelings, may be communicated to their noble countrymen.

MEMORANDUM OF CONDITIONS AMONG DESTITUTE REFUGEE AND OTHER INHABITANTS OF BITOLJI (MONASTIR) AND SOUTHWEST MACEDONIA

I am advised by the president of the council at Bitolji that there are at this time 600 Christian families averaging five persons to each family who are destitute and almost entirely dependent on state and local aid for bread on which to live. There is being furnished to these families or to a large part of them, by the municipality of Bitolji, a small and entirely inadequate ration of flour, or in some cases the equivalent in money for their support. The fathers, or providing members of these families, are at the frontier, or have been killed in battle or died of disease, or are sick in hospital. The families are in extreme want, reaching in many instances to the starvation stage, and have no means of providing food for themselves by work or begging, and are dependent on the meager aid given them by the authorities.

For the present the Serbian government has assigned a sum of money, about 15,000 dinars ($2,100), to relieve the suffering of these people. The allowance of bread or flour or money is too small to keep them from a state bordering on starvation, but it serves a useful purpose in relieving the urgent needs of a number of these people. This supply of money, it is thought, will last for about two months, and the municipal authorities feel quite sure that it will be supplemented by a further advance from the Serbian government when the present funds are exhausted.

While the present warm weather continues, this class of destitutes will be able to manage to live on their meager allowances, with a little assistance from outside sources. With the approach of winter, however, the amount of aid now furnished will in no way be sufficient, and the material suffering, which is now so emphatically apparent among them, will be much greater. The close housing which the inclement weather will compel will breed pestilence and disease, and in their exhausted physical state, death will add its horrors to the sufferings of these people. Clothing, fuel and sufficient food must be provided in order to enable them to gather strength for the winter months, and it should be provided without delay, if disease and a fearful attendant mortality is to be prevented. The clothing these people now possess is not sufficient to keep them warm were the weather colder, and it does not afford the necessary change for personal cleanliness and health. In addition to the foregoing class, there are in Bitolji 7,000, Mussulmans, about half of whom are children and infants, who are in a decidedly worse condition, and to whom little or no state aid is extended. The only source of food is a derivation from the charity of more fortunate persons of their faith, and the bounty of charitable institutions and societies from abroad, chief among which is the British Bible Lands Missionary Society, whose bounty is dispensed through the English Consul at Bitolji, Mr. Greig, and a similar charity extended by the American missionary, Rev. W. P. Clarke and his wife. Through funds furnished Mr. Greig by the Bible Lands Missionary Society, these people, to the small number of 214 families, about one-seventh of the total number, receive a ration of one loaf or oke (2⅝ pounds) of bread per day for each adult, and half an oke for each child, and on this food these people are absolutely dependent and have been for weeks. Their suffering and starvation is real, and were it not for this small allowance, supplemented by gathering grasses and herbs from the fields, all but the most hardy of them would have died long since.

The children live on bread alone, and many of them go all day long without any food save what they are able to beg, which is little enough. They have not known the taste of meat for months. Infants are starving for lack of nourishment. The poor emaciated mother is unable to provide either the milk from her breasts or money to purchase cow's milk. There is little tinned milk available. These children linger along starving, until in many instances acute disease attacks, and mercifully ends their sufferings in death.

Even with the little ration doled out by the municipality, the mothers cannot provide enough for their children. The ration is in most cases issued in flour, a handful being given to each mother. The amount is hardly enough to make into bread, and an incident occurred recently when a mother took her flour home and, to add to the bulk of her loaf of bread, mixed ashes with the flour and baked it. This was given to the children that night, and the following day two of them died. Another incident occurred, in which a mother of five children sent them to bed hungry, having had nothing to eat all day. The eldest complained most bitterly, and plaintively asked, "What kind of mother are you to send us to bed without bread?" The mother left her house and at the late hour of night begged from neighbor to neighbor for bread for her starving children. Such instances are by no means exceptional, and misery and starvation are the rule. These people have sold everything movable and salable for food. The tiles from the roof, the surplus furniture, bed clothing and kitchen utensils, and so have lived from day to day, until this source of revenue has been exhausted and they have nothing left. What will be their fate when winter comes is beyond any imagination, unless sufficient, systematic aid is given them. Sanitation is difficult even under favorable surroundings. It is impossible among such a large number of people, where food, clothing, fuel and the barest of life's necessities are completely lacking. These people have no physical resistance, and among them disease and contagion will breed disease and contagion, until every house that shelters one of them will become a pest house and threaten the entire people with its pestilence. They suffered a heavy mortality the past winter and spring, when conditions of living were somewhat better, and they had not reached their present state of physical exhaustion, and it will be necessary to provide proper and sufficient food to these unfortunates, if even a greater mortality among them is to be avoided with the approach of the winter months.

Fortunately housing will prove a simple problem, and will solve itself. Bitolji is half deserted, and many Mussulmans, owners of property, who have moved away, permit the people of their faith to live on their vacated premises. But food, clothing and fuel should be provided without delay, and an organized charity be effected, to prevent this destitution.

Arrangements are being made to take over the municipal hospital at Bitolji, subject to the approval of the American Sanitary Commission. This hospital will be opened and operated for the civil poor alone. It has a capacity of 100 beds, and with 3,000 hospital days each month no little good can be accomplished by it. In addition to providing shelter and treatment for the civil poor, a free dispensary can be maintained for outside patients. All the foregoing applies to the city of Bitolji alone with its 35,000 inhabitants, one out of every three of whom are destitute.

In Ochrida, Debra and other villages of this prefecture the suffering and want are more intense, although the number in each of these villages is much smaller. People, especially children and infants, are dying of starvation, and scenes of emaciation like those pictured in the China famine are by no means uncommon in the smaller settlements. Frightful as it may seem to be, it is no less true that starvation is running a very close race with disease in causing the heavy mortality which these people have experienced.

B. W. CALDWELL, M.D.

Transparency of Abdominal Walls at Term

To the Editor:—In THE JOURNAL, July 31, 1915, p. 465, there is an abstract from a German obstetric and gynecologic journal. The article in question is by one Ahlfeld, and in this abstract the following sentence occurs:

> In one woman [at term, he means] the walls [uterine] were so transparent that the different parts of the uterus, the ovaries and tubes could be inspected with ease, and several graphic tracings were taken of the *child's breathing* [italics mine].

This gives me pause. I am prepared to concede almost anything to German efficiency. When I read that they were raiding the atmosphere for nitrogen, my hat was off to the achievement of the German scientist; but when I read that the German babies abstract oxygen from the amniotic fluid in utero, I feel like saying to the Allies, "Come on boys, call off the dogs; put out the fire, and let's go home; it's no use." Or maybe the illustrious Teuton has discovered that the German fetus is equipped with gills. This assumption in a way seems plausible, for at times I am unable to tell if the Teuton is fish, or flesh, or fowl. Now I may be displaying British stupidity, but honestly, Doctor, do German babies breathe in utero, and if so, how?

W. W. JARRELL, M.D., Thomasville, Ga.

[COMMENT.—Ahlfeld's words in the original are: "Durch die verdünnten Bauchdecken sah man . . . die Nabelschnur liegend. Sehr schön waren die Atembewegungen des Kindes zu verfolgen, wie wenn das Kind unter einer leichten Decke läge." The fetal movements which later become the respiration movements of the child, are what he means. He refers to this in the first paragraph of the article, saying, "Während meiner Tätigkeit als Assistent und als Leiter einer Frauenklinik habe ich der äusseren Untersuchung Schwangerer und Gebärender ein ganz besonderes Interesse zugewendet; um so mehr, nachdem ich auf die eigentümlichen fötalen Bewegungen aufmerksam wurde, die sich später als kindliche Atembewegungen herausstellten, und oft stundenlang Besichtigung des Leibes und Beobachtungen der Vorgänge innerhalb desselben vornehmen musste." However, it would have been decidedly better if "Atembewegungen" had been translated "breathing movements."—ED.]

Boston Park Shows

To the Editor:—A new educational method has been introduced with success this summer in Boston. The problem of how to reach a large number of the population who seldom read, if they read at all, has been met with considerable success by what may be called "teaching with fun."

A committee was formed composed of representatives of the Antituberculosis Society, Boston Young Men's Christian Association and Young Men's Christian Union, the Women's Municipal League, Massachusetts Child Labor Committee, Milk and Baby Hygiene Association, Massachusetts Society for the Prevention of Cruelty to Animals, and the Poster Campaign Committee of the Associated Charities. These societies, united by their common interest in civic betterment and public health, cooperated in organizing and supporting the following plan: Each society subscribed $25 and guaranteed another $25 if necessary to meet the expenses. An active executive committee was formed. The plan was to lay out a program of moving picture shows, together with phonographic music, to be given five evenings in each week for a period of six weeks or more in the pleasure parks in different parts of the city. A program committee obtained interesting pictures and selected moving picture films which were hired; the program being varied every night. The committee secured the cooperation of some of the city departments, such as the Park Commission, and from private firms obtained the use of phonograph and records, and an automobile truck to transport the whole show. It was necessary to hire an operator and a manager who obtained the necessary permissions and saw that everything was ready and in place and made all immediate arrangements.

The programs were carefully arranged to give entertainment, and every third or fourth film or picture was educational.

It was estimated that during the first ten nights 60,000 people saw these shows. The shows began at 8:15 and lasted about two hours. Most of the people remained to see the whole performance and showed great enthusiasm at certain pictures, such as the weighing of a baby in a milk station.

The possibilities of public education appear to be very great through this form of entertainment. Since ignorance of hygiene and public health matters is one of the greatest difficulties which the physician meets today, we commend this form of education to the attention of the medical profession.

A. B. EMMONS, 2D, M.D., Boston.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

RHEUMATISM

To the Editor:—What is the generally accepted opinion at present as to the cause of rheumatism, or what is rheumatism?

C. W. RITTER, M.D., McLean, Ill.

ANSWER.—The term "rheumatism" is perhaps the most loosely and carelessly used of medical words. It has been applied to such a varied array of human complaints that unless qualified by some descriptive term it may be said to have no meaning at all.

One of the most common diseases to which "rheumatism" is applied is acute articular rheumatism or "rheumatic fever." This is a fairly well-defined clinical entity, characterized by its occurrence usually in the young, its prolonged course, migratory invasion of joints, fever, sweating, etc. Even in this disease, the term "rheumatism" is expanded so as to describe some of the special features of the disease as well as the disease itself; for example, "cerebral rheumatism" and "cardiac rheumatism," by which are meant certain complications involving the brain or heart, arising from the infection, and not directly related to changes in the joints.

Multiple lesions of joints occur in certain of the infectious diseases. Gonorrheal rheumatism and scarlatinal rheumatism express the superficial similarity of these processes to the form of joint disease named. The more exact terms "gonococcal arthritis," "periostitis" or "streptococcal arthritis" should, of course, now be used.

Other forms of multiple arthritis, more recently shown to be due to localization of micro-organisms resident in some focus of infection in the body, present clinical pictures which pass by slight grades of extent and severity of symptoms from those very similar to acute rheumatic fever to the more chronic deforming arthritides which hitherto have been placed in the heterogeneous collection called arthritis deformans, or rheumatoid arthritis.

In all of these, the use of the word "rheumatism" adds nothing but confusion, and the conditions might better be described as acute or chronic arthritis, prefixing a more specific anatomic or bacteriologic title when such is possible. In extenuation of these uses of the word "rheumatism," we must in justice admit that many lesions of joints were first recognized clinically as associated with certain diseased conditions of other parts of the body (scarlatinal "rheumatism"), and that it is only by our more recently acquired knowledge of pathology and bacteriology that we are enabled to make more cleancut etiologic distinctions.

"Rheumatism" calls up in the minds of most of us various concepts associated with joint lesions, such as swelling, redness, heat, pain, disability, etc. Almost any diseased state presenting one of these features as the prominent sign or

symptom has at some time or other had the term "rheumatism" applied to it.

Pain is frequent in various types of arthritis; "rheumatism," therefore, has been made to stretch a few points further, to cover any unexplained pain in almost any part of the body, with the result that rheumatism of the heart is substituted for angina pectoris; muscular rheumatism may include anything from pleurisy to the myositis of trichiniasis, rheumatism of the bones may be due in reality to osteomyelitis, tabes dorsalis or fracture.

The latter misuses of "rheumatism" are obviously dependent, not on legitimate lack of knowledge of etiology of arthritis, but to carelessness and ignorance of clinical medicine. We need not continue further through the long list of misapplications of "rheumatism."

A more careful use of words, including "rheumatism," means a better understanding of pathology and clinical medicine, and hence a more successful therapy. This has recently been emphasized by McCrae in his address on "The Use of Words" (THE JOURNAL, July 10, 1915, p. 135).

If now we restrict the question "What is rheumatism?" to an inquiry as to the etiology of arthritis and allied disorders, we may briefly summarize our knowledge of their causes.

The recent studies of Rosenow and others tend to confirm the finding of Poynton and Paine that acute rheumatic fever is caused by a streptococcus (*Streptococcus rheumaticus*). This organism has been isolated from the blood and from affected joints when appropriate cultural methods have been employed. The arthritides associated with infectious diseases are commonly caused by invasion of joints by the associated organisms (gonococcus, streptococcus, tubercle bacillus, etc.). The large group of acute and chronic arthritides associated with focal infections are caused by the localization in joints of the bacteria occurring in the local foci (for example, streptococci and certain bacilli). These invasions of joints may be repeated, and, depending on peculiarities of joint tissue, individual resistance and trauma of use, give rise to more or less extensive anatomic changes, so that the joints finally present the picture we recognize as arthritis deformans. As already hinted, arthritis deformans has been in the past a sort of medical rag-bag in which were placed those chronic cases in which progressive deformity of joints and absence of apparent etiology were the prominent features. Many of these we now recognize to be the result of chronic infections; others, particularly in the aged, may be related to disturbances in blood supply, and a constantly dwindling minority are still (but doubtfully) classified as "metabolic" in origin.

Other types of joint lesions, such as those associated with trauma, gout or with nervous diseases (Charcot's joint of tabes), are encountered less frequently.

The painful areas in muscles (myositis), and various lesions in the skin (erythema nodosum, etc.) which are seen in connection with the arthritides are often due to bacterial embolism occurring in the same way as that of the joints.

ARTICLES ON VAGINAL DISCHARGES—RECIPROCAL RELATIONS OF OREGON

To the Editor:—1. Please give me a list of references to recent articles on vaginal discharges, especially those dealing with bacteriology and therapeutics.

2. Please state the reciprocity relations between Oregon with Illinois and Wisconsin.

J. R. NEWMAN, M.D., Madison, Wis.

ANSWER.—1. The following is a list of references to recent articles on this subject:

Liepmann, W.: Advantages of Dry Treatment of Leukorrhea, *Therap. Monatsh.*, December, 1910; abstr., THE JOURNAL, Feb. 11, 1911, p. 467.

Gottschalk, S.: Causes and Treatment of Leukorrhea, *Deutsch. med. Wchnschr.*, Feb. 6, 1913.

Koch, J. A.: Dry Treatment of Leukorrhea and Cervical Erosions, *Illinois Med. Jour.*, December, 1913.

Theilhaber, A.: Causes and Treatment of Idiopathic Uterine Hemorrhage and Leukorrhea, *Arch. f. Gynäk.*, 1914, cii, No. 1; abstr., THE JOURNAL, March 21, 1914, p. 972.

Curtis, A. H.: Etiology and Bacteriology of Leukorrhea, *Surg., Gynec. and Obst.*, March, 1914; abstr., THE JOURNAL, March 28, 1914, p. 1050.

Curtis, A. H.: Pathology and Treatment of Chronic Leukorrhea, *Surg., Gynec. and Obst.*, July, 1914; abstr., THE JOURNAL, Aug. 8, 1914, p. 311.

McMorrow, F.: Vaginal Discharge, *New York State Jour. Med.*, July, 1914; abstr., THE JOURNAL, Aug. 15, 1914, p. 608.

Field, T. S.: Pathologic Vaginal Discharges, *Florida Med. Assn. Jour.*, December, 1914.

2. Oregon does not have reciprocal relations with Illinois or Wisconsin.

Book Notices

RADIOGRAPHY, X-RAY THERAPEUTICS AND RADIUM THERAPY. By Robert Knox, M.D., M.R.C.S., L.R.C.P., Hon. Radiographer, King's College Hospital, London. Cloth. Price, 25 shillings net. Pp. 406, with 246 illustrations. London: A. & C. Black, 1915.

In this work the author has made a full review and a satisfactory statement of the subjects indicated in his title. The largest part of the work, 250 pages, is devoted to roentgenography. The whole subject is considered in great detail, from apparatus to the most difficult points in diagnostic technic. Particularly to be commended in this part of the work are the many plates illustrating the various subjects which are studied in roentgenographic diagnosis. These illustrations are so numerous and so well printed as to make a veritable atlas of roentgenography. Roentgen-ray therapy is given nearly eighty pages. It is not considered with such thoroughness as roentgenography, but the author has given a good exposition of the subject, fairly complete, temperate and honest. Particularly useful is the first chapter on the effect of the Roentgen ray on healthy and diseased tissues. Nearly sixty pages are given to radium therapy. The subject is briefly considered, but with sufficient fulness to give the reader a satisfactory grasp of the technic and of the field of usefulness of the method. The volume is a fine example of book work. A heavy glazed paper is used so that the many illustrations come out beautifully. The print is so large and clear that the reading of the book is a physical pleasure. Both author and publisher are to be complimented on the volume.

THE CARE OF THE BABY. A Manual for Mothers and Nurses, Containing Practical Directions for the Management of Infancy and Childhood in Health and in Disease. By J. P. Crozer Griffith, M.D., Professor of Pediatrics in the University of Pennsylvania. Sixth edition. Cloth. Price, $1.50 net. Pp. 463, with 101 illustrations. Philadelphia: W. B. Saunders Company, 1915.

This book is known to physicians by repeated issues since 1895. The sixth edition is fully revised and rewritten to meet the most up-to-date principles in the care of the expectant mother, infants and young children. The author anticipates the eager questions of the anxious mother, with many simple practical suggestions. In the chapter on "Exercise and training," without direct reference, the author recognizes the influence of the freudians, and cautions against ghost stories and grim as well as Grimm's fairy tales. To write a chapter on the sick baby for those not medically trained is obviously a difficult task. Much of the material in this section, because of its technical nature, might well be omitted without serious injury to the ultimate purpose of the book. The appendix contains numerous practical formulas and directions for physical therapy.

OCCUPATIONAL AFFECTIONS OF THE SKIN. A Brief Account of the Trade Processes and Agents Which Give Rise to Them. By R. Prosser White, M.D., M.R.C.S., Senior Physician, Royal Albert Edward Infirmary. Cloth. Price, $2 net. Pp. 165. New York: Paul B. Hoeber, 1915.

The author's effort in this work has been to collect in readily accessible form the knowledge which we possess of the damages caused to the skin by the irritants used in various occupations. He states in his very modest preface that the origin of the work was his own necessities; it is not often that a man meets his own needs better than the author must have done in this book. He has brought together an enormous amount of information concerning skin diseases produced by occupational causes, and neither the author nor any one else who consults it will be likely to find anything lacking which he wants to know on this subject. The work might, indeed, have well been entitled, "A Consideration of the Dermatoses Produced by External Irritants"; for it covers not only the usual occupational dermatoses, but also the dermatoses due to poisonous plants, and many of those due to parasites. There is no other book on the same subject in the English language. White's book not only is valuable to dermatologists, but also is one which may be consulted

with profit by any one concerned with the subject of occupational diseases in general. The author is to be congratulated on the production of a book which, small though it is, puts the profession under obligation to him.

TRAUMA UND PSYCHOSE MIT BESONDERER BERÜCKSICHTIGUNG DER UNFALLBEGUTACHTUNG. Von Prof. Dr. Hans Berger, Oberarzt der Psychiatrischen Universitätsklinik. Paper. Price, 6 marks. Pp. 208. Berlin: Julius Springer, 1915.

The groundwork of this study is a careful analysis of 378 cases of psychic disturbance or mental disease following, for the most part, vocational accidents. Dealing as it does with the effects of such accidents, the influence of trauma on the development of psychoses in children before the end of school time is not considered. Those cases are considered, however, which, although due to trauma, did not come under the accident compensation law and are, therefore, not influenced by claims for damages, as such cases frequently give a clearer insight into the traumatic origin of many psychoses. Epilepsy is given separate consideration, as it does not belong, strictly speaking, to the psychoses. In the first part the author discusses the general proposition of psychoses following trauma. He disagrees with Schlager and Krafft-Ebing, who hold that psychoses following head injuries have characteristics which distinguish them as traumatic, but thinks that a head injury may be, but not necessarily is, a causative factor in almost any form of mental disturbance. In the special part he takes up the various psychoses in their relation to trauma, including those following lightning and electric injuries, and carbon monoxid and other forms of poisoning. A well-selected bibliography follows each chapter, and a rather complete index closes the work. It is an interesting exposition of the question from the point of view of the mental specialist.

Miscellany

The Link of Medicine

AN ENGLISH COMMENT ON THE CHICAGO WAR UNIT

We announce in another column the arrival in England from the United States of a complete medico-military unit, known as the Chicago Unit, comprising the full medical and nursing organization for a general hospital of 1,040 beds. The establishment consists of thirty-two medical men (physicians, surgeons, specialists, a radiographer and a pathologist) and a nursing staff of seventy-five women, including the matron. The unit has been recognized by the War Office. Every one of our readers will admit with gratitude the practical sympathy of a splendid sort which is thus displayed by the United States, while we understand that similar units may be expected to arrive from America, taking their departure from other great cities, and animated with the same quick and deep desire to minimize as far as possible the horrors of war. From a private communication which we have received from one of the staff of the Chicago Unit, it is easy to guess that there will be no dearth of applicants in other American centers for what will necessarily be very hard and perhaps dangerous work. The medical men and nurses of the Chicago Unit were selected from several hundreds of applicants, every man's post could have been filled at least six or seven times, and a brisk competition prevailed among candidates for the nursing staff. The same rivalry will hold good elsewhere. And here we may add that a generous citizen of Chicago has personally offered to meet the large difference in pay between the salaries of military nurses in the British army and the salaries of nurses in the United States, where, as is well known, skilled assistance of every kind is rated at a higher figure than prevails with us in this country. We are certain that the American nurses did not need money as an incentive, but it is equally certain that some of the most experienced of them could not have undertaken to volunteer unless the pecuniary footing of their employment had been made sure.

Medicine is here proving itself a real link between nations. When we get down to the simple fact of a man in pain, in sickness, and perchance in peril of his life, the differences that exist between one country or state and another, arising out of political conventions, trading regulations, unhealed quarrels or injudicious speeches, may, we see, disappear altogether, and the action of the United States displays this medical spirit splendidly. We must not forget that the war is practically a world war, and that its results now give rise to very serious mental and material trouble to the United States, the only first-class power still remaining neutral. While the greater part of the inhabitants of the United States, though maintaining political neutrality, are known to see eye to eye with the Allies in the rights of the quarrel, there is still a section among them who hold a different view, and who make the satisfaction that comes from complete unanimity very hard to obtain. Again, the trade of America is embarrassed and her financial position is complicated in many directions by a struggle in whose origin she at any rate had no part. Because of all this the European war is a subject of painful anxiety on the part of the inhabitants of the United States, and their action in helping our armies in the field by providing hospitals in accordance with the recognized military pattern, to be placed under the control of the War Office, is one for which we must be very grateful. Nor must we forget to express appreciation of the fact that among American surgeons and physicians who have come to the help of our sick and wounded are some who have left lucrative practices and important positions on hospital staffs or in connection with universities in order to lend their aid in the hour of need. This alone would show that the medical impulse is at the bottom of their action; the citizens of the United States are not taking sides so much with the Allies against the Germans as with the sufferers against the triple alliance of disease, privation and injury.—*Lancet*, London, July 3, 1915.

Medicolegal

Power of Assistant Superintendent to Employ Physician for Injured Employee

(*Ward vs. J. Samuels & Bro., Inc.* (R. I.), 93 Atl. R. 649)

The Supreme Court of Rhode Island approves of a judgment in favor of the plaintiff, a physician, for the full amount of his claim for services rendered in the treatment of a boy who, while in the employ of the defendant, was severely injured on one of the elevators in its store. The defendant's assistant superintendent notified the plaintiff, and sent the boy to his office. The plaintiff continued the treatment of the boy until he was cured, making charges for his services against the defendant on his books of account. The assistant superintendent had been instructed to immediately summon and employ a physician in case of injury to an employee or a customer in the store, but authority to bind the defendant for more than first aid was denied. Still the jury was warranted in finding from the testimony, the court says; that in other cases in which the plaintiff had given more than first aid attention to injured employees, he had charged his entire services against the defendant; though subsequently, in certain cases, if not in all but one, on the request of the defendant's superintendent, he made out another bill for the services against a mutual benefit association which had for its purpose some benefit to the employees of the defendant, which latter bill had been paid; yet he had rendered the services on account of the defendant, on what he had a right to believe was its request. As a general rule, the superintendent of a mercantile corporation has not implied authority to bind it to pay for the services of a physician whom such superintendent has called to attend an employee of the corporation who has been injured in the course of his employment. But this court has also held that, in case of the employment, by an unauthorized agent of a corporation, of

a physician to attend one of its servants who has been injured in the course of his service, without restriction as to the extent of the medical attendance to be given by said physician, the corporation, after notice of such employment, by its conduct and by its silence, may be held to have ratified the acts of its agent, or to be stopped from denying the agent's authority. Here it appeared that the assistant superintendent was the agent of the defendant especially empowered to attend to employees injured in the store, and to engage physicians for their treatment to a limited extent at least. In these circumstances notice to him with reference to the business thus delegated to him, including notice regarding the conduct and the claims of physicians so employed by him, must be held to constitute notice to the defendant. According to the testimony of the plaintiff and his witnesses, although the facts were denied by the assistant superintendent, the latter knew that the plaintiff had taken the boy's case with the expectation of treating him as long as medical attention should be required; that the plaintiff was continuing such treatment, and, further, that in the circumstances the plaintiff would probably regard the treatment as rendered on account of the defendant and to be charged to it. These facts being known by its responsible agent, having the duty to act on them himself or to report them to the defendant, it became the legal duty of the defendant to apprise early the plaintiff of the true condition of affairs, to explain the extent of the authority of the assistant superintendent and the limit that it intended to place on its own liability. If, in these circumstances, the assistant superintendent and the defendant remained silent, the defendant is not to be permitted to deny its liability.

Manslaughter in an Attempt to Perform a Surgical Operation

(People vs. Hunt (Col.), 147 Pac. R. 476)

The District Court of Appeal of California, First District, affirms a conviction of the defendant, an osteopath, of manslaughter, the Supreme Court of the state denying him a rehearing. The District Court of Appeal says that the evidence showed that the defendant was called to see a married woman who was suffering after having some days before been thrown from a motorcycle and being about five months advanced in pregnancy. He told the woman's sister that he was not the doctor for the case, but that a surgeon should be called in. An ineffective effort was made to secure the attendance of one or more regular physicians, when, on the sister's insistence, the defendant said that he would do what he could, went away and returned with a valise and, after asking for hot water and towels, was alone with the patient half an hour, after which he went in search of a physician. The latter had the woman taken to a hospital, where, with another physician, she was found suffering from internal injuries which could be reached only by abdominal incision, which being made, exposed the fact that a shockingly unskilful operation had been attempted for the manifest purpose of procuring an abortion, but in the course of which vital organs had been so severed and injured that it was not likely the patient could survive, and she in fact died within the next two days from the effects of the operation which the defendant had attempted to perform. It was error to instruct the jury as the trial court did. The right of persons to perform or attempt to perform surgical operations on others, in the honest and reasonable belief that such operations are necessary in order to save the life of those needing such ministrations, is not confined to those who are licensed by the state to perform surgical operations of the nature of that attempted in this case. Any person actuated by the reasonable belief, based on the circumstances, that such an operation is necessary to save life, and who acts with due caution and circumspection in the performance of such operation, cannot be held guilty of manslaughter. But the evidence affirmatively and indisputably showed that the defendant, in his attempted performance of the operation in question, acted with a shocking degree of unskilfulness, evincing an almost incredible ignorance of surgery and anatomy, and utterly wanting in those elements of skill, caution and circumspection which the law requires and which should invariably attend on such an operation. These being the undisputed facts and uncontradicted proofs in the case, the errors of the court in giving the instructions to which the defendant objected became immaterial; and this for the reason that in any event it would have been the duty of the jury to find the defendant guilty of manslaughter, and for the jury to have failed to perform this duty in this case would have clearly amounted to a miscarriage of justice.

Arresting or Restraining Insane Persons

(Bisgaard vs. Durall (Ia.), 151 N. W. R. 1051)

The Supreme Court of Iowa reverses a judgment for $2,000 damages recovered by the plaintiff for alleged false arrest. The court says that the defendant had employed the plaintiff and had communication concerning him with the physician member of the board of insane commissioners of the county, who caused his arrest. The mere fact that the defendant pointed out the plaintiff to the officer who went to arrest him and expressed the opinion that he should be arrested did not make him liable if the person who made the arrest did so on his own motion or at the instigation of another. The singular thing about this record was that when the defendant offered to show what the physician said to the defendant about reporting the plaintiff's condition, as indicating his mental condition, and as to what he reported to and said to the physician just prior to the plaintiff's arrest, the trial court sustained objections to questions calling for this information, on the ground that it was hearsay, immaterial and irrelevant. Manifestly these rulings were erroneous and highly prejudicial, as they went to the very vitals of the case. The most that could be said for it was that it showed that, at the physician's request, the defendant truthfully reported conditions as he found them, and that the physician on his own motion, and without any request or indication from the defendant that he wished him to do so, had the sheriff of the county arrest the plaintiff. Under such a showing, no recovery could be had under the law. An insane person stands on a different plane from that of a criminal; and for his own good, as well as for the protection of the community, he may often be restrained by any person, especially by one having an interest in him, or by one whose safety may depend on his detention, may be taken in charge without a warrant. The restraint of an insane person or of a person claimed to be insane is not designed as a punishment for an act done. It is well established that an insane person, without any adjudication, may lawfully be restrained of his liberty for his own benefit, either because it is necessary to protect him against a tendency to suicide, or to stray away from those who would care for him, or to protect others from his assaults, or other depredations, or because proper medical treatment requires it. Of course, all such arrests or restraints must be reasonable and in good faith; and instructions to the jury as to such restraints should be carefully guarded. But it is manifestly erroneous to say, as the trial court did in this case, that an insane person cannot be taken into custody or restrained in any other way than on a warrant issued as prescribed by law.

Society Proceedings

COMING MEETINGS

Amer. Assn. of Obstetricians and Gynecologists, Pittsburgh, Sept. 14-16.
American Electro-Therapeutic Association, Atlantic City, Sept. 14-16.
American Public Health Association, Rochester, N. Y., Sept. 7-10.
American Roentgen Ray Society, Atlantic City, Sept. 22-25.
Association of Military Surgeons of the U. S., Washington, Sept. 13-15.
Indiana State Medical Association, Indianapolis, Sept. 23-24.
Kentucky State Medical Association, Louisville, Sept. 21-23.
Michigan State Medical Society, Grand Rapids, Sept. 1-2.
Minnesota State Medical Association, Rochester, Sept. 29-Oct. 1.
Missouri Valley Medical Society, Des Moines, Sept. 23-24.
New Mexico Medical Society, E. Las Vegas, Sept. 6-8.
Oregon State Medical Association, Portland, Sept. 9-10.
Pennsylvania State Medical Society, Philadelphia, Sept. 20-23.
Utah State Medical Association, Salt Lake City, Sept. 28-29.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

July, XVIII, No. 1, pp. 1-144

1 On Proportions, Development and Attachment of Tectorial Membrane. I. Hardesty, New Orleans.
2 Effects of Acute and Chronic Inanition on Relative Weights of Various Organs and Systems of Adult Albino Rats. C. M. Jackson, Minneapolis.
3 Development of Neuromuscular Spindle in Extrinsic Eye Muscles of Pig. A. C. Sutton, Baltimore.

American Journal of Diseases of Children, Chicago

August, X, No. 2, pp. 77-152

4 *Some Studies on Sugar in Infant Feeding. L. Porter, San Francisco, and C. H. Dunn, Boston.
5 Pyloric Hypertrophy in New Born Infants. F. L. Wachenheim, New York.
6 *Studies in Bronchial Glands. W. W. Howell, Boston.
7 *Acute Nonepidemic Inflammation of Sublingual Glands in Children; an Affection of Unknown Origin. H. Neuhof, New York.
8 *Protective Therapy for Mumps. A. F. Hess, New York.
9 Parapharyngeal Abscess as Distinguished from Retropharyngeal and Peritonsillar Abscesses. H. Heiman, New York.

4. **Infant Feeding.**—The urines of a group of infants in the Boston Infants' Hospital, who were suffering from what would be known in Europe as "balance disturbance," but which in the nomenclature of the Boston school is called "chronic indigestion," were tested by Porter and Dunn. Eighteen of these babies were investigated; none of them were of the premature type such as Aschenheim found to have intestines more permeable to sugar than those of older nurslings. The first tests were all made while the children were receiving what was considered a normal amount of sugar advisable for their individual peculiarities. Later, attempts were made on a number of the cases to find the limit of physiologic tolerance for the sugars. The reagent used in the determinations was the one recommended by Folin as the most sensitive to reducing bodies.

Sixteen of the eighteen patients showed reducing bodies in some tests before the treatment with picric acid. Eight showed a loss of reducing power after shaking with picric acid. Three patients showed appreciable amounts of reduction constantly in all samples of urine after the picric acid treatment. One of these had an eczema corresponding in type to the exudative diathesis of the Czerny school, but in spite of the fact that this patient received as much as 120 gm. of lactose, 15 per cent. of his intake per day while he was receiving 4 per cent. of fat at the same time, there was never enough sugar in the urine to be assured by any of the usual quantitative methods and coincidently the skin condition improved steadily under local treatment. The other two patients of this group were suffering from rather extreme malnutrition. Of the 105 samples of urine, 58 showed reducing powers to Folin's solution before shaking with picric acid. Of these 58, 27 lost their reducing power after such treatment. Of the eighteen patients, excepting the three referred to above, none showed reducing bodies every day, and in no instance did there seem to be any relation between the amounts of sugar ingested and the presence of these bodies as they were found in the urine with minimum intake, and were frequently absent following the highest ingestion.

None of the cases tested were of the severest type of malnutrition. One or two of the patients were babies having no gastro-intestinal disturbance. One presented a case of congenital obliteration of the bile ducts. The majority were babies who had presented difficult feeding cases in the outpatient clinic, and had been sent into the hospital to be straightened out. None showed any marked intolerance for any of the food elements. The majority were comparatively mild cases of fat intolerance, showing indigestion and excessive fat in the stools when the fat was increased. No case known to show a marked intolerance of carbohydrate was tried. Symptoms of intolerance developed eventually in twelve of the sixteen cases. Three patients were taken home, and one patient died, before the experiment was completed. It seems to the authors that the idea of sugar injuries and sugar intoxication has possibly kept clinicians from the use of large amounts of soluble carbohydrate in certain cases, particularly with those unable to take a quantity of fat sufficient to meet their nutritive requirements.

6. **Studies in Bronchial Glands.**—In order to determine the frequency of chronic adenitis of the bronchial glands in infancy and childhood, the reliability of the signs, and the possible pathology of the gland, Howell examined the glands, during the past year, in all cases coming under his care, no matter for what reason. Out of a total of 505 children examined in the school there were 112 with positive D'Espine at or below the third dorsal. Of the positive cases 96 were at the ages of 6, 7 and 8 years from a total of 297 cases at these ages. The remaining 16 positive cases were at the ages of 9, 10, 11 and 12 years. For some reason, positive D'Espine was very much more frequent in the younger half, 36 per cent. as against 8 per cent. The most common defects at the younger age were carious teeth, adenoids and tonsils and if such patients had chains of enlarged glands down the neck, showed positive D'Espine.

Most of the younger children were in good condition, might have a cough but showed no malnutrition or anemia. Some of them were undernourished and anemic, and beside a positive D'Espine showed interscapular dulness or a slightly dull apex. The older groups, sixteen in all, gave a different picture. Ten undernourished, anemic children had interscapular dulness and dulness at one apex; three no dulness but were anemic and undernourished; three in good condition had carious teeth and glands in the neck; no case in either group with so-called active tuberculosis, meaning with active pulmonary signs. Among the younger half there were 27 with a history of definite exposure to tuberculosis and among these were found the cases with positive D'Espine, dulness and malnutrition. In the older half, in the 13 cases with D'Espine, dulness and malnutrition there was a history of exposure in every case. The other three showed merely a positive D'Espine without dulness or malnutrition, and gave no history of exposure. Hence Howell believes that a positive D'Espine with interscapular dulness means thickening at the roots of the lungs, secondary to a process in the lungs which in infancy means tuberculosis, and, in older children, if accompanied by malnutrition and anemia, is probably tuberculosis.

7. **Nonepidemic Sublingual Inflammation.**—A group of cases of sublingual gland inflammation in otherwise healthy children is presented by Neuhof, differing in clinical picture and in etiology from the hitherto described acute nonepidemic lesions of these glands. The usual causes of acute inflammation of the sublingual glands are not in evidence. The characteristic features are: Sudden onset of sublingual and median submental swelling with mild febrile manifestations; scattered red spots in the mucous membrane over the sublingual swelling, interpreted as inflamed orifices of the sublingual ducts; rapid increase in size, often to grotesque proportions, of the moderately painful submental swelling, frequently accompanied by pronounced reddening of the overlying skin; early recession of the sublingual swelling, contrasting with persistence of the submental tumor for one to three weeks; fever slight and general condition good throughout the course; no complications, sequelae, or recurrences.

8. **Prevention of Mumps.**—Twenty children were given protective injections by Hess. They were, for the most part, children who had entered the hospital before the age of 1 year. Naturally, none were injected who had had mumps in the course of the epidemic of the winter of 1912-1913 and who had acquired immunity in this way. Whole blood was used and was injected at once intramuscularly. The donors from three groups: The first includes children, four in number, who were just recovering from mumps; the second comprises ten children who had recovered from the disease about ten days previously; there is a third group, composed

of six children who had had mumps one or two years before. It should be added that the results of the treatment in the last group cannot be considered convincing, in that three must be entirely left out of consideration, as they did not happen to come in contact with active cases of the disease, and because the other three had been in the institution but six weeks. There were no disagreeable manifestations following the injections—neither a rise of temperature nor local reaction. The epidemic was so widespread that only three of the children under treatment did not come into contact with the disease. There are therefore seventeen who must be regarded as having been not only susceptible, but also exposed to mumps. It is therefore striking to note that among these seventeen, none contracted the disease. In the wards in which the children were not protected by injection, fully one-third, or even one-half, came down with the disease.

Arizona Medical Journal, Phoenix

June, III, No. 6, pp. 4-9

10 Symptomless Appendicitis. E. B. Palmer, Phoenix.

Arkansas Medical Society Journal, Little Rock

July, XII, No. 2, pp. 35-60

11 Cancer of Uterus. J. G. Eberle, Fort Smith.
12 Organization of National and Local Forces in Campaign Against Cancer. C. E. Lakeman, New York.
13 Importance of Sanitation. E. C. Meyers, Fort Smith.
14 Public Health from Economic Standpoint. H. Thibault, Scott.

Boston Medical and Surgical Journal

July 29, CLXXIII, No. 5, pp. 151-186

15 Work and Aims of Massachusetts State Department of Health. A. J. McLaughlin, Boston.
16 *Lobar Pneumonia. F. T. Lord, Boston.
17 Infant Mortality. J. L. Morse, Boston.
18 *Control of Typhoid. M. W. Richardson, Boston.
19 *Preventable Heart Disease. R. I. Lee, Cambridge.
20 Tuberculosis. A. K. Stone, Boston.
21 Syphilis. A. Post, Boston.
22 Contagious Diseases. E. R. Kelley, Boston.
23 Spotted Fever of Rocky Mountains. G. F. Pope, Winnemucca, Nev.

16. **Lobar Pneumonia.**—The following recommendations briefly outline the measures which Lord believes may be expected to diminish the incidence of pneumonia: 1. Education of the public concerning the manner in which respiratory infections take place and the means of avoiding them. 2. Closer supervision of the acute respiratory infections, such as ordinary "colds," so-called influenza, bronchitis and sore throats and isolation of the more severe types of these simpler infections when possible. 3. Closer supervision of patients with pneumonia by: (*a*) making pneumonia a reportable disease, (*b*) isolation of patients with pneumonia. 4. Avoidance of overcrowding and the regulation of housing conditions. 5. The diminution of dust in cities. 6. Immunization of those exposed in times of epidemics.

18. **Control of Typhoid.**—The most effective slogan for the immediate future in the prevention of typhoid, in Richardson's opinion, must be "Wash your hands before handling food, whether it be for yourself or for other people's use."

19. **Preventable Heart Disease.**—Lee emphasizes that most heart disease is due to an antecedent infection. The prevention of heart disease is the prevention of infection. While it is true that certain infections like the tonsillitis-rheumatic fever symptoms-complex group and syphilis are particularly associated with cardiac disease, yet logically every infection may be regarded as a possible carrier of damage to the heart. There does not seem to be adequate appreciation of the possible sequelae of infections, particularly rheumatic fever. Continued supervision after infections is important in order that an early endocarditis may be detected and the resulting damage be minimized. At present the development of medical inspection and supervision of schoolchildren seems the next step.

California State Journal of Medicine, San Francisco

July, XIII, No. 7, pp. 251-292

24 Treatment of Infection. S. Bunnell, San Francisco.
25 Use of Lane Plates in Fractures; Report of Forty-Eight Operations. F. R. Fairchild, Woodland.
26 Gas Bacillus Infection. G. M. Barrett, San Francisco.
27 Progress of Ophthalmology in Year 1914. H. Barkan, San Francisco.
28 Suggestions of Biliary Tract Surgery for General Practitioner. F. W. Birtch, San Francisco.
29 Studies in Gastric Secretions. R. Pollock, San Diego.
30 Routine Examination of Cerebrospinal Fluid in Suspected Syphilis of Nervous System. T. G. Inman, San Francisco.
31 Autonomic Reflexes from Digestive Tract. H. B. Reynolds, Palo Alto.
32 Ring to Ring Incision for Herniorrhaphy. H. M. Sherman, San Francisco.
33 Pertussis. W. W. Bchlow, San Francisco.
34 Urobilin Test in Malaria. J. R. Snyder, Sacramento.
35 Astragalectomy for Tuberculosis of Tarsus. L. W. Ely, San Francisco.

Canadian Medical Association Journal, Toronto

July, V, No. 7, pp. 565-660

36 Relation of Anatomic Structure and of Antagonism Between Organs to Disease. H. Oertel, Montreal.
37 Parenteral Digestion and Immunity. J. G. Adami, Montreal.
38 Phenomena of Anaphylaxis and Allergy and Their Relationship to Immunity. F. B. Gurd, Montreal.
39 Prophylactic Use of Bacterial Vaccines. L. J. Rhea, Montreal.
40 Therapeutic Employment of Vaccines. J. C. Meakins, Montreal.
41 Fat Metabolism and Its Relation to Acidosis. V. H. Mottram, Montreal.
42 Case of Hemorrhagic Chickenpox. D. G. Campbell, Montreal.

Journal of Experimental Medicine, Lancaster, Pa.

August, XXII, No. 2, pp. 123-268

43 Heart Muscle in Pneumonia. L. H. Newburgh and W. T. Porter, Boston.
44 *Serum Ferments and Antiferment After Feeding. J. W. Jobling, W. Petersen and A. A. Eggstein, Nashville, Tenn.
45 *Serum Ferments and Antiferments During Trypsin Shock. J. W. Jobling, W. Petersen and A. A. Eggstein, Nashville, Tenn.
46 *Immunologic Relations of Rous Chicken Sarcoma. W. H. Woglom, New York.
47 Castration Exerts no Influence on Growth of Transplanted or Spontaneous Tumors in Mice and Rats. J. S. Hilario, New York.
48 *Inflammatory Reactions in Rabbits with Severe Leukopenia. W. E. Camp and E. A. Baumgartner, Minneapolis.
49 *Artificial Production in Mammalian Plasma of Substances Inhibitory to Growth of Cells. A. J. Walton, London.
50 *Lymphocyte in Natural and Induced Resistance to Transplanted Cancer. J. B. Murphy and J. J. Morton, New York.
51 *Numerical Laws Governing Rate of Excretion of Urea and Chlorids in Man. F. C. McLean, New York.
52 *Extirpation of Pineal Body. W. E. Dandy, Baltimore.
53 *Concentration of Protective Bodies in Antipneumococcus Serum. Specific Precipitate Extracts. H. T. Chickering, New York.

44. **Serum Ferments and Antiferment After Feeding.**—According to the authors, an increase in noncoagulable nitrogen of the serum can be determined after feeding, reaching a maximum in about six hours. This increase is greatest in the portal blood and is partially due to an increase in amino-acids. There is no increase in proteoses. There is usually a progressive decrease in serum protease, reaching a minimum after from five to seven hours. The portal blood may show an unaltered or an increased amount of protease. The serum antiferment shows a slight increase, but is subject to considerable fluctuation. The serum lipase (esterase) shows a slight increase, reaching a maximum after three hours. The hepatic blood usually contains the lowest concentration of lipase.

45. **Serum Ferments and Antiferment during Trypsin Shock.**—The experiments conducted by the authors have demonstrated that when active trypsin solutions are injected into the blood stream an intoxication results, manifested by marked gastro-intestinal irritation, a rise of temperature, with a primary leukopenia, followed by a leukocytosis. There is usually an immediate rise in serum protease and serum esterase, together with a lengthening of the coagulation time, which in some instances may lead to a complete inhibition of coagulation. In many ways the picture is not dissimilar to anaphylactic shock. In the latter condition there is associated, however, a marked increase in the noncoagulable nitrogen of the serum, representing protein split products, and in so far differing from the effect with trypsin. The antiferment usually shows a distinct drop in titer, with a recovery following in from four to twenty-four hours. The noncoagulable nitrogen shows no constant alteration, but is never greatly changed in amount. Inactivated preparations were in some respects followed by symptoms similar to those following the injection of the active preparation. Subcutaneous and gastric absorption was practically without effect. Intestinal absorption was followed by an increase

in serum protease without evidence of intoxication, or by typical symptoms of acute poisoning. The leukocyte curve bears no constant relation to the serum protease or lipase.

46. **Immunologic Relations of Rous Chicken Sarcoma.**—The injection of chicken embryo extracts, in amounts of from 1 to 10 c.c., Woglom says, confers no resistance against the Rous chicken sarcoma, when this is inoculated from five to one hundred days after the preliminary treatment.

48. **Inflammatory Reactions in Rabbits.**—The object of the investigation made by Camp and Baumgartner was to study the local reaction to injury in animals in which a severe leukopenia had been produced experimentally. Congestion of blood vessels and marked edema may occur in rabbits with a severe leukopenia. These two phenomena are, therefore, independent of the leukocytes. When the leukocyte count is below 1,000, croton oil and heat produce no leukocytic exudate in the tissues of the ear, and carmin produces no exudate in the muscles. In rabbits with severe leukopenia there are apparently no antibacterial bodies present. Benzol does not destroy the leukocytes in an abscess.

49. **Artificial Production of Inhibitory Substances.**—Active immunity to the growth of tissue was obtained by Walton by intraperitoneal injections of tissue emulsions. This immunity was of short duration and was followed by an anti-immunity. The immunity varied for individual tissues both in extent and in the time of onset. The immunity was not specific in so far that it was not more marked for the tissue similar to that forming the emulsion.

50. **Lymphoid Activity.**—The facts as they stand out from the experiments made by Murphy and Morton are (1) that a marked lymphocytosis arises after inoculation with cancer in both the naturally immune animals and in the animals with induced immunity; and (2) when the lymphocytosis is prevented by a previous exposure of the animal to Roentgen ray the resistant state is abolished. All the evidence points, therefore, toward the lymphocyte as a necessary factor in the immunity processes, and the finding offers a probable explanation of the results of Apolant who found that it was more difficult to render splenectomized animals immune to cancer than intact ones. The refractory state to transplanted cancer, induced by the subcutaneous injection of defibrinated blood, was accompanied in every case by a definite lymphoid crisis in the blood. The rise of lymphocytes is not present during the interval between the immunizing injection and the cancer inoculation but comes on sharply within twenty-four hours of the introduction of the cancer graft. In control animals in which the graft leads to a definite take there is no such lymphoid response, but in instances of natural immunity, the phenomenon is similiar to that seen in artificially induced immunity, though the period of rise is often delayed for several days or a week. The lymphoid crisis is not merely an accompanying factor in the immune period; it is essential to the process. This is demonstrated by the fact that destruction of the lymphocytes by Roentgen ray is accompanied by the loss of natural or induced resistance to the growth of inoculated cancer. The polymorphonuclear cells show a tendency to increase in the animals with growing tumors, but further study will be necessary before any conclusions regarding them can be drawn.

51. **Laws Governing Rate of Excretion in Man.**—The excretion of urea and of chlorids in the normal individual, McLean says, is carried out according to definite laws, capable of numerical expression. The rate of excretion of urea and of sodium chlorid is determined by the concentration in the blood, the rate of water output, and indirectly by the weight of the individual. The threshold of sodium chlorid excretion is practically constant at about 5.62 gm. of sodium chlorid per liter of plasma. Slight variations in the threshold occur in normal individuals. The rate of excretion of urea under the conditions found at any time can be measured directly in terms of the normal by an index of urea excretion.

52. **Extirpation of Pineal Body.**—The pineal was reached by Dandy from in front through the third ventricle rather than from behind. In this way the extensive bleeding consequent to liberation of the vein of Galen is obviated, and the operation can be performed almost bloodlessly. This is accomplished by dividing the splenium of the corpus callosum in the midline for a distance of about 2 cm. from its posterior terminus. This exposes the transparent roof of the third ventricle which is distended by the contained cerebrospinal fluid. A large anemic area is visible in the midline of the roof of the ventricle, between the two small veins of Galen. This is perforated and the opening enlarged backward to the origin of the vena Galena magna by releasing the blades of the forceps. The entire third ventricle is thus brought in full view and the pineal body is readily seen under the origin of this vein, in the median quadrigeminal groove. The pineal body can easily be grasped in the jaws of the cupped biting forceps and completely removed. Following the removal of the pineal Dandy observed no sexual precocity or indolence, no adiposity or emaciation, no somatic or mental precocity or retardation. His experiments seem to have yielded nothing to sustain the view that the pineal gland has an active endocrine function of importance either in the very young or adult dogs. The pineal is apparently not essential to life and seems to have no influence on the animal's well being.

53. **Protective Bodies in Antipneumococcus Serum.**—The protective substances contained in specific precipitates from antipneumococcus serum Chickering found can be extracted by suitable chemical and physical agents, dilute sodium carbonate at 42 C. being especially advantageous as an extractive agent. The resulting water-clear extracts, when made up to the original volume of the serum used for precipitation, protect animals almost as well as does the whole serum. The bacterial extracts used in precipitating the protective substances from the serum act specifically; that is, a bacterial extract of pneumococcus of Type I removes the protective substances from Type I immune serum only. In a polyvalent serum of Type I and Type II, the protective substance of each type may be removed independently of each other by the successive addition of the homologous antigens. Extracts of specific serum precipitates contain only one-fiftieth to one-sixtieth of the protein in the original serum, and about one-half the protein of the whole precipitate. Extracts contain not only protective substances but agglutinins and precipitins. Extracts and whole precipitates not only confer passive immunity but stimulate the production of active immunity to pneumococcus infection in rabbits and mice.

Journal of Outdoor Life, New York

July, XII, No. 7, pp. 212-242

54 Decline of Nightcaps. C. S. Brooks, Cleveland.
55 Infectiousness of Tuberculosis. H. M. Biggs, Albany.
56 Useful Order of "I. W. W." G. T. Palmer, Springfield, Ill.
57 Public Health Values—Few Modern Sanitary Fallacies. D. B. Armstrong, New York.
58 Cooperation of Public Health Nurse in Detection and Control of Tuberculosis. E. L. Foley, Chicago.
59 Standards of Diagnosis and Medical Care in Tuberculosis Clinics. W. J. Denno, New York

Kansas Medical Society Journal, Topeka

July, XV, No. 7, pp. 205-234

60 Cancer Question. C. C. Nesselrode, Kansas City.
61 Recurrence of Cancer After Operation. J. C. McClintock, Topeka.
62 Prevalence of Cancer. S. G. Dixon, Philadelphia.
63 Present Status of Cancer Research. L. Loeb, Philadelphia.
64 Early Diagnosis of Cancer. W. L. Rodman, Philadelphia.

Lancet-Clinic, Cincinnati

July 17, CXIV, No. 3, pp. 53-72

65 Use of Quinin and Urea Hydrochlorid in Sciatica and Allied Conditions; Report of Cases. H. A. Cables, East St. Louis, Ill.
66 Report of Roentgen-Ray Treatment of Menorrhagia and Uterine Fibroids. S. Lange, Cincinnati.
67 Fraud and Misrepresentation. A. Seaton, Indianapolis.
68 Physical Manifestations of Dementia Praecox. B. Holmes, Chicago.

July 24, No. 4, pp. 73-92

69 Angina Pectoris. A. F. Beifeld, Chicago.
70 Multiple Benign Cystic Epithelioma; Report of Four Cases. J. W. Miller, Cincinnati.
71 Case of Ectopic Ureter. E. Ries, Chicago.
72 Efficient Health Administration. H. B. Wood, Topeka, Kan.

Medical Record, New York

July 31, LXXXVIII, No. 5, pp. 173-214

73 Water in Prevention and Cure of Tuberculosis. S. A. Knopf, New York.
74 Study in Blood Counts in Relation to Vaccine Therapy. J. Head, Philadelphia.
75 Provision for War Cripples in Germany. D. C. McMurtrie, New York.
76 Some Suggestions Concerning Treatment of Gastro-Intestinal Symptoms of Pellagra. G. M. Niles, Atlanta, Ga.
77 Delirium. E. L. Hunt, New York.
78 Fulguration in Gonorrheal Folliculitis. G. K. Swinburne, New York.
79 Fetid Bronchitis. B. Robinson, New York.

Missouri State Medical Association Journal, St. Louis

July, XII, No. 7, pp. 299-352

80 Economics of Practice of Medicine. H. C. Shuttee, West Plains.
81 Truth and Tuberculosis. E. S. Bullock, Silver City, N. W.
82 Treatment of Tabes Dorsalis. A. L. Skoog, Kansas City.
83 Chromaffin System and Glands of Internal Secretion. J. Sundwall, Lawrence.
84 Factors in Removal of Tonsils. J. S. Weaver, Kansas City.
85 Accurate and Rapid Estimation of Sugar in Urine. E. B. Knerr, Kansas City.

Modern Hospital, St. Louis

July, V, No. 1, pp. 1-70

86 Mount St. Mary's Hospital at Niagara Falls, N. Y. M. Cherubim, New York.
87 Simplification and Standardization of Surgical Technic in Hospitals. W. L. Babcock, Detroit.
88 Grenfell's Wonderful Works in Labrador. S. E. Demarest.
89 Advantages of Cooperative Purchase of Supplies for State Hospitals Through Central Committee. A. P. Herring, Baltimore.
90 Old Building Transformed into Venereal Hospital. H. Wright, Cleveland.
91 Plea for Simplified Laboratory Report for Hospitals. H. T. Child, Kankakee, Ill.
92 Meat Extracts, Proprietary Preparations and Beef, Wine and Iron. J. P. Street, New Haven, Conn.
93 Officer of Day—System of Hospital Management. J. R. Hicks, New York.
94 Little Things That Are Big Things in Hospital Management. R. J. Wilson, New York.
95 Care of Cases of Mental Disease in General Hospitals. H. M. Hurd, Baltimore.
96 Staff Organization. R. E. Castelaw, Kansas City, Mo.
97 Training School. J. L. Baer, Chicago.

New York Medical Journal

July 31, CII, No. 5, pp. 221-272

98 Total Transverse Lesions of Spinal Cord. J. H. Lloyd, Philadelphia.
99 Renal Tuberculosis with Occlusion of Ureter. E. F. Kilbane, New York.
100 Visceral Stasis, Mechanical Obstructions and Their Effects Relievable by Rational Measures. J. M. Taylor, Philadelphia.
101 Acanthosis Nigricans; Report of Case. W. Frick, Kansas City, Mo.
102 Cancer of Uterus. H. Schmitz, Chicago.
103 General Faradization (Bergonié) in Treatment of Obesity and Other Pathologic Conditions. H. F. Wolf, New York.
104 Psychotherapy. O. Lerch, New Orleans.
105 Hernia in Chronic Insane. J. A. Jackson, Philadelphia.
106 Sex Discussion. L. A. Stone, Memphis, Tenn.
107 What Shall We Do with Sing Sing Prison? C. D. Bles, New York.

Northwest Medicine, Seattle, Wash.

July, VII, No. 7, pp. 205-238

108 Recent Advances in Our Knowledge of Carcinoma. J. E. Else, Portland, Ore.
109 Early Diagnosis of Cancer. C. J. Brobeck, Tacoma.
110 Some Clinical Aspects of Cancer of Stomach. G. F. Kochler, Portland, Ore.
111 Treatment of Cancer. W. B. McCreery, Tacoma.
112 Treatment of Inoperable Cancer. S. P. Beebe, New York.
113 Present Status of Serum, Bacterin and Vaccine Therapy. J. L. McDonald, Boise, Idaho.
114 Surgery of Hand. J. T. Mason, Seattle.
115 Nasal Septum. J. B. Roth, Portland, Ore.
116 Therapeutic Value of Cortical Substance of Kidney; Report of Case. L. Ricen, Portland, Ore.
117 Some Points of Technic in Abdominal Wound Closure. J. A. Pettit, Portland, Ore.

Ohio State Medical Journal, Columbus

July, XI, No. 7, pp. 421-480

118 Cancer: What We Know About It and What We Can Do for It. F. C. Wood, New York.
119 Cysts of Prostate; Report of Case. W. E. Lower, Cleveland.
120 Diagnosis of Cancer of Rectum and Sigmoid Flexure. W. Teachnor, Columbus.
121 Surgical Shibboleths. J. Ransohoff, Cincinnati.

Philippine Journal of Science, Manila

January, X, No. 1, pp. 1-97

122 *Cholera Carriers in Relation to Cholera Control. E. L. Munson, U. S. Army.
123 *Cholera Carriers. G. Schöbl, Manila.
124 Development of Eggs of Ascaris Lumbricoides. L. D. Wharton, Manila.
125 *Occurrence of Bacillus Coli Communis in Peripheral Blood of Man During Life. E. H. Ruediger, Manila.
126 *Preparation of Tetanus Antitoxin. E. H. Ruediger, Manila.
127 Cesarean Section in Philippine Islands. F. Calderon, Manila.
128 Case of Obstructed Labor and Cesarean Section. R. B. Woodward, U. S. Navy.
129 Adenocarcinoma of Cecum, Complicated by Intussusception. R. M. Thornburgh, Manila.
130 *Two Compounds of Emetin Which May be of Service in Treatment of Entamebiasis. A. G. DuMez, Manila.
131 Treatment of Infantile Beriberi with Extract of Tiqui-Tiqui (Rice Polishings). J. Albert, Manila.

122. **Cholera Carriers in Relation to Cholera Control.**—It is emphasized by Munson that in effectively combating a cholera infection the use of laboratory facilities in the making of bacteriologic diagnosis on a large scale is absolutely essential. The recent outbreak in Manila was spread chiefly by personal contact. Cases were isolated so promptly as to do little harm. Lack of the use of toilet paper, certain habits in the use of the toilet, infected fingers and eating with the hands food taken from a common dish were the channels through which the infection chiefly passed from the carrier to another person. Public water supplies and articles of food could be eliminated as channels of infection and flies played an entirely insignificant part in its spread. One of the most apparent lessons learned relates to the possible period of latent infection in cholera and its bearing on the period of incubation and quarantine heretofore accepted for health work. The five-day period usually accepted for incubation and quarantine ordinarily will suffice for the control of infection in the majority of cases; but such a period does not hold good in a very considerable number of instances, which sheds much light on cholera situations not otherwise readily explainable. For example, one carrier, who died of cholera, might have traveled halfway around the world, scattering his infection broadcast during his eighteen-day period as a carrier, and died of true cholera in a place many thousands of miles from any other source of infection. The prompt eradication of a general cholera infection, therefore, includes the detection and isolation of carriers.

123. **Cholera Carriers.**—Of thirty-nine gallbladers examined by Schöbl for the presence of the cholera vibrio, three showed macroscopic lesions. In two instances hydrops cystitis fellea was found; that is, distended gallbladder containing mucous bile of light-amber color and flaky sediment. When stirred, the bile assumed a milky appearance. One gallbladder was rather small; the wall was evidently thickened, and the contents were of a rather dark color. On microscopic examination the epithelium was found desquamated, the blood vessels distended, and the mucous membrane showed a high degree of round-cell infiltration. Blood corpuscles were found free in the lumen of the gallbladder. The cystic duct showed like changes, but the epithelium was not desquamated altogether. Pure cultures of the cholera vibrio were obtained from all three specimens. The cholera vibrio was found seventeen times in the thirty-nine gallbladders.

125. **Bacillus Coli Communis in Blood of Man.**—During routine bacteriologic examinations of blood at the Philippine General Hospital, four cases of blood infection by *Bacillus coli communis* came under Ruediger's observation. Two of the cases proved fatal and two ended in recovery.

126. **Preparation of Tetanus Antitoxin.**—Ruediger states that a suitable strain of the bacillus of tetanus will usually produce potent toxin when grown in nearly neutral glucose broth under hydrogen. The acidity of the broth will rise to more than 2 per cent. normal acid, and it should be neutralized with sodium hydrate before it is injected into the horse. Potent tetanus toxin was obtained by the method described by Hall. By this method the acid is continuously neutralized by the magnesium carbonate present. Horses

differ greatly in the power of producing tetanus antitoxin. Of eight horses reported by Ruediger one produced 150 units per c.c. of serum, two produced 300 units per c.c. of serum, one produced 350 units per c.c., and in the serum of one the antitoxin rose to 400 units per c.c. Three horses produced 500 or more units of tetanus antitoxin per c.c. of serum. The antitoxin curve reached its highest mark in from six to nine months after the beginning of immunization.

130. **Emetin in Treatment of Endamebiasis.**—Emetin mercuric iodid was prepared by DuMez by precipitating an acidified aqueous solution of emetin hydrochlorid with Mayer's reagent, collecting and washing the precipitate with water, and drying in the air at a temperature below 50 C. The samples used for analysis were dried over sulphuric acid. The composition of the resulting precipitate was found to vary with the concentration of the solution. The procedure in the preparation of emetin bismuthous iodid was similiar in all respects to that followed in the preparation of emetin mercuric iodid, except that Dragendorff's instead of Mayer's reagent was employed in forming the precipitate. Here, also, the composition of the precipitate was found to vary with the concentration of the solution. DuMez believes that emetin mercuric iodid should be decomposed in the stomach to a slight extent only. On coming in contact with the alkaline secretions of the intestines, the compound will likely be decomposed with the formation of emetin; finally, as the free base and a salt of mercury which will eventually be converted in part into the albuminate, in which condition it enters the circulation. Therefore one should expect the combined action of both emetin and mercury compound on the entamebas. Insoluble salts of bismuth are converted into bismuth sulphid after passing the pylorus. In all probability the reaction is slow and takes place as the compound is being spread out over the walls of the intestine. Emetin will probably be liberated slowly at the seat of the trouble. The author suggests that the comparatively poor results obtained from the administration of emetin by mouth are probably due to its too rapid absorption and elimination. These two compounds can be given in doses representing 0.03 gm. of emetin hydroiodid without causing vomiting and without any apparent nausea; but vomiting does occur when either of them is given in large doses.

Providence Medical Journal

May, XVI, No. 3, pp. 145-186

132 Indications and Contraindications for Abdominal Cesarean Section. R. McPherson, New York.
133 Colloidal Gold Reaction. F. J. Farnell, Providence.
134 Erythema Multiforme. H. W. Kimball, Providence.

July, No. 4, pp. 187-236

135 Some Conditions Affecting Practice of Medicine in City of Providence. S. A. Welch, Providence.
136 Acute Intussusception in Infants. F. V. Hussey, Providence.
137 Prolongation of Human Life. H. S. Bernstein, Albany, N. Y.
138 Old Medical School in Brown University. F. P. Gorham, Providence.

Public Health Journal, Toronto

July, VI, No. 7, pp. 309-362

139 Administration of Toronto Department of Public Health. H. L. Brittain, Toronto.
140 Death Rate of British Columbia. W. G. Home, Edinburgh.
141 Tuberculosis Problems from Public Health Standpoint. D. A. Craig, London, Ontario.
142 Early Diagnosis of Tuberculosis. D. Townsend, River Glade, New Brunswick.

Wisconsin Medical Journal, Milwaukee

July, XIV, No. 2, pp. 35-76

143 Contraindications to Use of Knife in Treatment of Skin Cancers of Face. A. Drexel, Milwaukee.
144 Epithelioma of Eyelids; Six Cases Treated by Roentgen Rays S. G. Higgins, Milwaukee.
145 Colles' Fracture. O. Fiedler, Sheboygan.
146 Fractures in Region of Elbow. W. E. Fairfield, Green Bay.
147 Thyroid in Pregnancy. K. W. Doege, Marshfield.
148 Analysis of Obesity with Outline of Treatment. L. E. Axtell, Marinette.
149 *Effect of Heat and Cold on Larvae of Trichinella Spiralis. H. N. Winn, Madison.

149. **Effect of Heat and Cold on Larvae of Trichinella Spiralis.**—The results of Winn's experiments suggest the possibility that refrigeration may be substituted for microscopic inspection, with a much smaller cost and a higher degree of efficiency, to all pork products prepared under government supervision and in the larger packing houses. Contrary to the accepted view, cold of about 17.8 C. over a number of days effectually destroys the life of the encysted larvae. In case of any pork products prepared at home, or which might for any reason be suspicious, heating the meat to a temperature of 55 C. (131 F.) for a period of fifteen minutes for each pound, to insure that the meat would reach that temperature all through, would effectually safeguard the consumer from any danger of trichinosis.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, London

June, IX, No. 2, pp. 213-348

1 *Gangosa in New Guinea and Its Etiology. A. Breinl.
2 Theileria Tachyglossi (n. sp.) Blood Parasite of Tachyglossus Aculeatus. H. Priestley.
3 Investigation into Causes of Prevalence of Enteric Fever in Kingston, Jamaica; with Special Reference to Question of Unrecognized Carriers. H. H. Scott.
4 Occurrence and Prevalence of Diseases in British New Guinea. A. Breinl.
5 Insect Flagellates and Evolution of Disease. H. B. Fantham.

1. **Gangosa in New Guinea and Its Etiology.**—Case histories describing a few typical cases out of many examined are cited by Breinl to prove that gangosa, or rhinopharyngitis mutilans is a definite morbid entity, and can be differentiated from other diseases causing similar lesions, such as syphilis, lupus and leprosy. It is a very chronic but very rarely fatal complaint. A great number of the patients recover without specific treatment, mostly however, after the morbid process has brought about extensive destruction of the face. As the etiology of the disease is unknown, material was collected for microscopic examination. Special attention was paid to the early lesions with a view of finding a possible parasite in the edema fluid, obtained by pricking the skin over the lesion with a needle in the same way as serum would be obtained from a leprous nodule. The specimens were stained with Giemsa's stain. In the edema fluid of five early and two later cases, in addition to a small number of red and white corpuscles, small bodies were found resembling yeast cells. The majority of them occurred free, only a small number was contained in leukocytes. From their morphologic appearance there is no doubt in Breinl's mind that the cells are to be considered as parasites belonging to the genus Cryptococcus of the family Saccharomycetes. The characteristic features of Cryptococcus is the reproduction by budding only and the absence of endospores and ascospores. Breinl gives to this organism the name *C. mutilans.*

British Journal of Tuberculosis, London

July, IX, No. 3, pp. 111-170

6 *Housing and Tuberculosis. A. M. Williamson.
7 Reflections on Tuberculosis and Tuberculin. E. S. Bullock.

6. **Housing and Tuberculosis.**—Williamson summarizes his paper as follows: Pulmonary tuberculosis is a disease which in 70 or 80 per cent. of cases occurs in houses of three rooms and under; the number of cases is larger in two-roomed houses than in three; larger in houses of one room than in two; and the number of cases of tuberculous disease increases almost in direct proportion to the number of small houses in any district or ward of a city. Since the year 1882 the number of deaths from tuberculosis has shown a rapid and steady decrease; and a like statement applies to the general death rate and the death rate from other forms of infectious disease. This decrease has been taking place quite apart from, and irrespective of, any special effort to deal with the condition other than the preventive measures which have been carried out in the ordinary march of public-health administration. The establishment of sanatoria and dispensaries, while useful aids in carrying on a general crusade against this form of disease, are not of themselves likely to be attended by markedly beneficial results in the absence of other definite preventive measures. Preventive measures

center largely in the housing question, and irrespective of cost, there is an urgent need, in the light of our present-day knowledge, of dealing more effectively than has heretofore been the case with congested areas, dense foci of population and insanitary dwellings.

British Medical Journal, London

July 17, II, No. 2846, pp. 81-124

8 British Health Resorts in Peace and War. R. F. Fox.
9 Diagnosis, Prognosis and Treatment of Nerve and Muscle Injuries Resulting from Gunshot Wounds. F. Hernaman-Johnson.
10 Suggestions for Those Interested in War Depots at Home. J. Hossack.
11 Latent Dysentery and Intestinal Parasitism in Sarawak, Borneo. W. L. Christie.
12 Elastic Tissue Enigma. W. Ewart.
13 Trypanosomes Causing Disease in Man and Domestic Animals in Central Africa. D. Bruce.

Glasgow Medical Journal

July, LXXXIV, No. 1, pp. 1-80

14 Simple Peptic Ulcer and Malignant Disease of Stomach. W. MacLennan.
15 Vincent's Angina. J. Harper.

Journal of Royal Naval Medical Service, London

July, I, No. 3, pp. 227-372

16 Report on Wounded in Action between "Sydney" and "Emden." L. Darby.
17 Syphilis in Navy. J. S. Dudding.
18 Bacteriologic Examination of Contacts with Cerebrospinal Fever and Their Treatment. H. C. Whiteside.
19 Epidemic Cerebrospinal Meningitis; Report on Thirty-One Cases. B. S. Robson and A. L. P. Gould.
20 Simple and Safe Somnoform or Ethylchlorid Inhaler for Minor Operations. R. W. Hornabrook.
21 Paint Poisoning. A. R. Bankart.
22 Epidemic of Influenza in Island of St. Kilda. R. W. B. Hall.

Lancet, London

July 17, II, No. 4794, pp. 109-160

23 Trypanosomes Causing Disease in Man and Domestic Animals in Central Africa. D. Bruce.
24 *Breast Feeding; Some Functional Requirements of Gland and of Infant. H. K. Waller.
25 Binet-Simon Method and Intelligence of Adult Prisoners. M. H. Smith.
26 What Tests in Childhood are Best Calculated to Throw Light on Capacities of Mental Defectives for Future Work? W. A. Potts.
27 Three Cases of Complete Rupture of Uterus During Labor Treated by Abdominal Hysterectomy. J. F. R. Seheult.
28 Sigmoid Tortuosity of Internal Carotid Artery and Its Relation to Tonsil and Pharynx. A. G. T. Fisher.

24. **Breast Feeding.**—Waller deprecates the failure to pay enough regard to the periodic character of the breast secretion. For its establishment all that seems necessary is the regular stimulation of suckling with a sufficient interval between the infant's meals. If this be observed the woman will become aware of a sensation which is variously described as a rushing, tearing, or painful stabbing in the breasts, known as the "draught" and experienced as soon as the child's mouth is applied to the nipple. In some the breasts can be observed to swell and become tense when a few moments earlier they were flaccid and apparently empty. There is in all probability a contractile muscular element in the occurrence, but there is also an undoubted secretory activity, for milk runs spontaneously from the nipple. In cases in which the periodicity is firmly established the engorgement may even occur at the appointed time without the breast being stimulated by suckling; the flow lasts for a few minutes and then ceases. The experience of the "draught" early in lactation is undoubtedly helped by the strong suction of a healthy child. But it can quite well be demonstrated when the baby is weakly and premature, provided the proper requirements, to be mentioned later, are borne in mind. Its maintenance throughout the course of lactation is perhaps the surest sign that breast feeding has been normally carried out, and this is reflected in the almost invariable progress of the infants so fed. Conversely, in all cases in which a child has taken the breast for a few weeks and the "draught" is only felt occasionally or not at all, suspicion should be roused that the regimen is not satisfactory. Until this is regulated to meet the physiologic requirements of the gland, Waller believes the opinion should be withheld that successful breast feeding is not feasible.

He also believes that the custom of urging women to feed their infants at two-hourly intervals nine or ten times during the twenty-four hours is responsible for weaning in an enormous number of cases. A month is about the limit of time for which a woman can endure the two-hourly imposition, and when about then the signs of ailing are obvious, the breast milk is blamed rather than the rule which has been responsible for the trouble. In seemingly contradictory cases in which the child is thriving, a careful inquiry will usually discover that, though the rule was carried out at first, the sheer impossibility of obedience has led to its fracture, and a far longer period has been allowed to elapse between the feedings. In the case of the obedient it will be found that the "draught" which was felt regularly during the first few weeks became less and less noticed and the reflex overflow from one breast which normally occurs when the other is taken by the child has ceased. The infant is restless and dissatisfied, cries at the breast, and even refuses to suckle, the stools are infrequent, and the weight is stationary.

Practitioner, London

July, XCV, No. 1, pp. 1-144

29 Impotence in Men. W. Harris.
30 Sterility in Women — Survey. H. Macnaughton-Jones.
31 Medicolegal Aspects of Impotency in Sexes. J. Glaister.
32 Correct Life History of Fistula-in-Ano. I. Back.
33 Inflammatory Disease of Maxillary Antrum — Its Diagnosis and Treatment. G. S. Hett and N. S. Finzi.
34 Case of Paralysis of Diaphragm, Probably Post Diphtheritic. W. Downie.
35 Rodent Ulcer, Its Nature and Some Methods of Treatment. E. G. Little.
36 Orthopedic Surgery. A. H. Tubby.
37 Two Cases of Phlegmonous Duodenitis. K. Black.
38 Recent Work in Tropical Diseases. R. T. Hewlett.
39 Poisoning by Datura and Hyoscyamus. A. Ismael.
40 Treatment of Tropical Ulcers. S. Vassallo.

Bulletin de l'Académie de Médecine, Paris

July 28, 1914, LXXII, No. 29, pp. 63-102

41 Transmission of Tuberculosis Occurs Almost Exclusively by Sputum Dust. P. Chaussé and Letulle.
42 Urology and Mineral Metabolism with Cancer. A. Robin.
43 Antityphoid Vaccination in the Pregnant. G. Valmale and Vayssière.
44 Cesarean Section; Twenty-Nine Cases. G. Lepage.
45 "Physiologic Titration" of Drugs of Vegetable Origin is Not Always Reliable. A. Richaud.
46 Invasion of Lymphatics by Leishman Parasites. E. Jeanselme and Langeron.
47 Active Hyperemia in Treatment of Chronic Joint Disease. Abbé Gendron and P. Bouchet.

June 29, LXXIII, No. 26, pp. 743-797

48 *Heteroplastic Grafts to Close Gaps in Skull. (Réparation des pertes osseuses craniennes dans les plaies de guerre. Greffes hétéroplastiques.) P. Reynier.
49 *Efficacy of Antimeningococcus Serum Demonstrated Anew in Prevailing Epidemic of Cerebrospinal Meningitis. A. Netter.
50 The Wine Ration of the French Soldiers. E. Vidal.
51 *Typhoid in the Vaccinated. H. Bourges.

48. **Heteroplastic Operations on the Skull.**—Reynier has found a few cases on record in which a large gap in the skull was closed by a plate of bone taken from a dog or other animal, but in none of them is the ultimate outcome known although the results were eminently satisfactory at first. He reports a case from his own service in which he repaired an extensive breach in the skull from a shell wound by implanting a piece of bone taken from the scapula of a rabbit, with its periosteum. It was cut to fit the gap and the periosteum of the patch was sutured to that of the skull around. The outcome to date has been perfect.

49. **Serotherapy of Meningitis.**—Netter has applied antimeningococcus serotherapy in 226 cases of cerebrospinal meningitis since 1907. The mortality for which the meningococcus was responsible was only 12.5 per cent.; before the introduction of the serum it was 48.5 per cent. in the sporadic cases and 83.3 per cent. in the epidemic form. The efficacy of the serum, he says, is shown not only in the reduction of the mortality but in the attenuation of the symptoms, the rapid recovery and the rarity of complications.

51. **Typhoid Fever in the Vaccinated.**—Bourges relates that among 550 typhoid patients at Brest in the last two years, fifty-three had been vaccinated against typhoid. The typhoid was mild or medium in all but five, but these men had it in a grave and fatal form. Three of them had been inoculated four times, one three times, and one once only. Excluding this latter case as inadequately vaccinated, and excluding two others in which superposed infection was chiefly responsible for the fatality, this leaves only two deaths from the typhoid. The mortality among the nonvaccinated reached 15.2 per cent.

Presse Médicale, Paris

July 8, XXIII, No. 31, pp. 245-252

52 Syndromes from Wounds of Peripheral Nerves. II. (Les lésions des gros troncs nerveux des membres par projectiles de guerre. Les différents syndromes cliniques et les indications opératoires.) Dejerine and J. Mouzon.

Archiv für Verdauungs-Krankheiten, Berlin

June, XXI, No. 3, pp. 179-253

53 The Sphincter-Like Mechanism in Upper Esophagus. (Die Verschlussvorrichtung am Beginn der Speiseröhre. J. Schreiber.
54 *Technic for Reliable Findings as to Acidity in Stomach Content. (Soll die quantitative Aziditätsbestimmung im filtrierten oder im unfiltrierten Mageninhalt vorgenommen werden?) F. Seidl.
55 Syphilis of the Stomach. M. Einhorn.
56 Certain Physiologic and Psychologic Factors to be Observed in Esophagoscopy and Study of the Stomach. W. Sternberg.

54. **Technic for Tests of Gastric Acidity.**—Seidl writes from the outpatient department for stomach and bowel disease at the Vienna general hospital, to describe the results of his study of gastric acidity. It has demonstrated that the nonfiltered stomach content after a test breakfast shows a higher acid percentage than the filtrate. The gastric mucus is able to bind considerable alkali, and if there is much mucus the filtrate had better be taken to determine the acidity. Under other conditions, he advises to determine the acidity in the unfiltered, thoroughly stirred up stomach content. If there is a large amount of fluid this can be decanted after settling, and the acidity be determined in the well-stirred-up sediment.

Berliner klinische Wochenschrift

June 21, LII, No. 25, pp. 653-676

57 *Treatment of Lupus and Secondary Tuberculous Skin Lesions. P. G. Unna.
58 *Epidemiology of Typhus. (Fleckfieber.) Jürgens.
59 *Raising Prematurely Born Infants in the Home. (Aufzucht von Frühgeburten in der offenen Säuglingspflege.) J. Cassel.
60 Repeated Occurrence of Infectious Parapneumonic Streptococcus Empyema. Tykociner.
61 Is Eclampsia Result of Toxic Action of Decomposing Albumin? R. Schröder.

June 28, No. 26, pp. 677-704

62 *Serotherapy and Vaccine Therapy of Typhoid and Immunity. F. Meyer and E. F. Altstaedt.
63 Agglutination in Those Vaccinated Against Typhoid. (Verwertbarkeit der Widal'schen Reaktion bei Schutzgeimpften.) L. Dünner.
64 *Serum Anaphylaxis and Its Prevention. W. Koch.
65 Mobilization of Stiff Fingers and Joints in the Wounded. A. Laqueur and F. Roesky.
66 *Magnesium Glycerophosphate More Effectual and Less Toxic Than the Sulphate in Treatment of Tetanus. G. Zuelzer.

57. **Treatment of Lupus.**—Unna remarks that recurring nodules after a supposed cure, or small lupus lesions that have been treated on a mistaken diagnosis, may not require the modern expensive and tedious courses of physical measures. Any physician is liable to be called on to treat such cases, and the simple remedies, salicylic acid, zinc chlorid and creosote, are accessible to all and are the best. The "green lupus salve" has proved its usefulness for nineteen years. The formula for it is as follows:

Salicylic acid	
Antimony chlorid solution	āā 2 parts
Extract of cannabis	
Creosote	āā 4 parts
Lanolin	8 parts

(The antimony chlorid solution is a 33.3 per cent. solution of antimony trichlorid in 12,5 per cent. hydrochloric acid, called in Germany Liq. stibii chlorati.) The above formula can be modified at need to the following:

Salicylic acid	
Zinc chlorid	āā 2 parts
Opium	
Creosote	āā 4 parts
Lanolin	8 parts

The larger lupus patches are kept covered with this until they heal over. A thin sheet of rubber tissue or adhesive plaster is applied over it and the dressing does not have to be changed oftener than once or twice a week.

He adds that the most promptly acting and the best of all methods of treating lupus is by cauterizing the patches, painting them all once or twice with a mixture of equal parts of lactic acid and the antimony chlorid solution. As soon as the skin shows signs of inflammation—generally the next day—this is healed with a zinc sulphur paste. (The formula for the latter was given May 1, 1915, p. 1533.) The procedure is then repeated until all traces of the lupus have disappeared. When these drugs cannot be procured, a good substitute is made as follows. It has the advantage of the pain-reducing remedy, creosote, 3 parts of which are used to 1 part each of salicylic acid and mercuric chlorid in 20 parts collodion. This caustic collodion is applied to a patch not quite so large as a silver dollar. When oozing occurs, the zinc-sulphur paste is applied, and while this part of the patch is healing, a fresh part is painted with the collodion.

The curative principle in all the above is the cooperative action of a caustic and a macerating substance to cure the primary lupus affection. The tuberculous affections which develop secondary to tuberculous disease in glands or joints are mostly benign cold abscesses. Evacuation does not ensure against recurrence and the region is left still pathologic. Unna lauds the favorable influence in such cases of a salve soap rubbed thoroughly into the skin of the region. His formula is:

Potassium hydroxid	84 parts
Cod liver oil	500 parts
Distilled water	475 parts
Alcohol q. s. (about 20 parts)	

The proportion of cod liver oil is so large that not all is saponified, and thus it protects the skin against irritation. The patient rubs the salve soap on his hand, then dips the hand in water and rubs the soap into the skin as it foams. After repeating this four or five times all the soap is rubbed into the skin. The effect is soon apparent, and often renders operative measures unnecessary. He declares that all tuberculous affections are very favorably influenced by the above cod liver oil potassium soap, even tuberculous periostitis and tendon sheath processes, bone processes close to the skin, and all forms of tuberculous glands and skin lesions. The odor of cod liver oil is slight and easily masked with a little lavender or citronella oil added to the finished soap. It is a good plan to give cod liver oil internally at the same time.

58. **Typhus.**—Jürgens comments on the remarkably sudden outbreak of typhus in the concentration camp in his charge. In the course of a few days a number of cases developed suggesting influenza or typhoid, but the trouble proved to be typhus and hundreds came down with it. The German physicians and orderlies were withdrawn but a number were already infected and some died. The proportion of persons affected was far above that with any other epidemics that have been encountered in Germany, and the disease attacked those who had not been in direct contact with the sick or even close to them. The epidemic kept up as long as there was any one left to take it. No one seemed immune, and the disease did not vary in its severity during the course of the epidemic. The rôle of lice in the transmission of the disease was abundantly proved again and again. Not one of the physicians or orderlies in the vermin-free typhus ward contracted the disease during their four months' service there. But when part of the same personnel entered the vermin-infested wards, to superintend the disinfection, two came down at once with the disease. Jürgens consequently devoted his energies to exterminating lice, and describes, with illus-

trations, the arrangement of the buildings, etc., for this purpose. No further cases of typhus developed among the prisoners although no attempt at isolation of the sick was made.

Even if vermin get in again, there is no fear of typhus now, as the lice can find no infectious material to transmit. He says that nearly all the Russian physicians in camp contracted the disease notwithstanding their precautions. No lice could be found on a number of medical men and attendants who contracted typhus; the insects must have been left behind. Jürgens adds that it is not settled yet whether the infection is conveyed by the bite of a louse or by mere contact of the vermin with the skin. Early recognition of the typhus in the first case or cases is the main point in prophylaxis. In conclusion Jürgens emphasizes that the prevention of epidemics is possible if the physician depends on himself and does not rely on general isolation and disinfection measures. The importance of the physician's task is not lowered but has been completed and modified by the progress of medical science.

59. **The Prematurely Born.**—Cassel discusses the care of the prematurely born in the home. The child must be protected as much against overheating as against chilling, and, equally important, against infections. The mother must be instructed in the best way to accomplish this, and to draw the milk for the child and keep her breasts secreting properly. He has had 42 cases of this kind in his charge at an "infant consultation station." Eight of the infants were less than a week old; 21 less than two weeks; 9 less than three, and 3 less than five. The weight of 9 was from 1,270 to 1,500 gm.; of 16, from 1,500 to 1,800, and of 17, from 1,810 to 2,000 gm. The 13 exclusively breast-fed children all thrived well, but numbers of the artificially fed had more or less disturbance and 7 died, one from hydrocephalus, the others from gastro-intestinal trouble. The children seemed to thrive best on fat-poor milk mixtures: skimmed milk, the so-called *Magermilch*, which mothers can easily prepare; buttermilk and albumin milk. Starch and sugar must be given very scantily at first. Infections are less common in the family than in institutions, and rachitis and convulsions are also less frequent. He never encountered them in a severe form, but anemia is almost constant and often keeps up into the second or third year. In conclusion he mentions that this year closes the tenth year of the infant consultation station in his charge, and he expatiates on the enormous amount of good it has done in saving babies and in disseminating knowledge as to the care of infants. The city of Berlin appropriates over $125,000 every year for this form of infant welfare work.

62. **Vaccine Therapy of Typhoid.**—Meyer analyzes his experiences in sixty-two severe cases of typhoid in which vaccine treatment was applied. They seem to demonstrate that intravenous injection of a sensitized vaccine in the later stages of typhoid promotes immunization. He calls especial attention to the benefit from vaccine therapy applied immediately after defervescence as a means to ward off consecutive trouble and relapses.

64. **Prevention of Serum Anaphylaxis.**—Koch relates that the preliminary subcutaneous injection of 5 c.c. of antitoxin a few hours before the regular dose does not always ward off serum anaphylaxis. He reports the sudden death of a child of 6, with scarlet fever and diphtheria, at once after injection of antistreptococcus serum, after a preliminary small injection. The child had been injected with diphtheria antitoxin the third and sixth days of his illness, and the intravenous antistreptococcus serum injection was given the twentieth day. Nothing could be found to explain the sudden fatality but anaphylactic shock, except that the child was debilitated, its resisting powers at a low ebb. In such cases serotherapy should be applied with special caution. It is possible, Koch remarks in conclusion, that it would be wiser to leave an interval of twenty-four hours between the preliminary and the main injection of serum.

66. **Magnesium Glycerophosphate in Treatment of Tetanus.**—Zuelzer states that the glycerophosphate seems to have the efficacy of the sulphate without its dangers. Glycerophosphoric acid is a cleavage product of lecithin and hence seems better adapted for the purpose than the sulphate. It acts immediately, and the severest spasms rapidly subside under it, while in the moderately severe cases 10 c.c. of a 25 per cent. solution every three or four hours kept the convulsions under control and the patient free from nearly all pain. He has thus given for days at a time six or eight injections of 10 c.c. of a 25 per cent. solution without the least harm to the patient. Under this dose there is no noticeable change in the pulse. Tests on animals showed that the glycerophosphate caused only a slight drop in the blood pressure, compared to the considerable drop under magnesium sulphate.

Centralblatt für die Grenzgebiete der Med. und Chir., Jena

June, XIX, No. 1-2, pp. 1-192. Last indexed May 1, p. 1534

67 *Operative Treatment of Sciatica. (Ischias.) W. Schoppe.
68 *Jejunal and Gastrojejunal Ulcer After Gastro-Enterostomy. V. Lieblein.
69 *Diagnostic Importance of Urobilinuria for Surgery. J. Feldner.
70 *Ovarian Transplantation. W. Benthin.

67. **Operative Treatment of Sciatica.**—Schoppe reviews thirty-five articles on this subject and discusses the technic and results of severing the nerve, exposing and stretching it, Bardenheuer's "nervinsarkokleisis," neurolysis, Hölscher's and Stoffel's methods and "hersage." The uncertainty in regard to the action of these procedures, the danger with some of them, and the progress realized in nonoperative methods, especially by systematic injection treatment, have combined to throw the surgical methods into the discard. The future will decide whether or not this includes neurolysis and Stoffel's technic. The aim should be to render all surgical measures unnecessary. The details of the published cases of stretching of the exposed nerve are tabulated, the whole article filling sixty-three pages. This operative stretching not only failed to benefit, but entailed serious and permanent injury in certain cases.

68. **Peptic Ulcer.**—Lieblein gives summaries from the literature of 79 cases of certain jejunal ulcers and 50 cases of gastrojejunal ulceration, also of 9 additional cases, only casually mentioned, of 5 probable but not certain cases although an operation was performed, and 12 probable nonoperative cases. Each of the cases is discussed in turn, nearly 100 pages being devoted to the subject and the views of various writers on the etiology of peptic ulcer. In prophylaxis it would seem advisable to select the technic which has never been followed by a jejunal ulcer, that is, plastic operations on the pylorus and gastroduodenostomy. These operations best restore approximately physiologic conditions. We know, however, that plastic operations on the pylorus are not being done any more, and that gastroduodenostomy is peculiarly difficult of execution and in some cases cannot be done at all. It never would be the operation of choice for benign stomach affections. Consequently ordinary gastro-enterostomy is still the best routine method. The posterior gastro-enterostomy is safest, done with a short afferent loop. It is important further to refrain from mechanical trauma disturbing the circulation in the region in suturing or fastening the loop.

He insists that all protheses should be rejected in joining the stomach and intestine together because, when such are used, the gastro-enterostomy wound can heal only by granulation. The opening should also be made as wide as possible. Extremely important further is the internal treatment afterward by proper dieting, to irritate and injure the abdominal wound as little as possible. The diet must also have the hyperacidity in view, refraining from all substances known to increase gastric secretion. Dujarière urges refraining from alcohol in any form, and restricting the eating of meat, fish and eggs. Paterson also advises against the use of meat in any form for six months or until examination shows that the acidity is normal.

69. **Diagnostic Importance of Urobilinuria for Surgery.**—Analysis of forty-nine articles on urobilinuria shows that it is of such frequent occurrence that no far-reaching

conclusions can be drawn from it alone. But in combination with other symptoms it becomes instructive, especially when it accompanies jaundice or an abdominal tumor or apoplexy. Its mere presence as a factor in certain syndromes, or its absence, is significant. The aldehyd test for urobilinuria is so simple and easy that surgeons can readily apply it; in important cases its findings can be confirmed by the fluorescence test or duodenal tube. Urobilinuria from polycholia can thus be differentiated from the urobilinuria of cholangitis.

Surgeons have paid little heed hitherto to the diagnostic importance of urobilinuria, but time has shown that they are the ones to decide the matter. Feldner reviews the evidence to date as to the origin of urobilin. When there is abnormal destruction of blood corpuscles, urobilinuria is a symptom of relative insufficiency on the part of the liver. The liver is sound but is unable to cope with the excessive demands on it from the results of the hemolytic process. The source of origin of urobilin seems to be exclusively the flora of reducing bacteria, either in the intestines, as under normal conditions, or in the liver in pathologic cases. The urobilin formed in the intestines is taken up into the portal vein and thence into the liver, where it is passed along in the form of bilirubin if the liver is equal to its task. If not, urobilinuria results, but the urobilin is not formed in the liver.

Urobilinuria therefore indicates one of three things, (1) abnormal bacterial action with resulting inflammation either in the intestines or bile apparatus; (2) hemolytic conditions causing the liver to be so swamped with work that it cannot attend to it all and hence relative insufficiency results, or (3) the liver may be diseased so that it is unable to take care of even the normal amount of urobilin reaching it. For instance, with complete obstruction of the hepatic or common bile duct, bilirubin appears in the urine as a sign of the bile being backed up into the blood, but there is not a trace of urobilinuria, as no bile gets into the intestines. As soon as the gallstone passes along and leaves the passage free, the backed up bile pours into the bowel and more urobilin is produced than the liver can manage. The excess is thrown off in the urine. In case the duct becomes obstructed again, there is again no trace of urobilin in the urine. This alternation of positive and negative findings in the urine is important testimony against cancer as the cause of obstruction in the bile passages.

Gallstones in the gallbladder do not entail urobilinuria until inflammation develops, and then it is pronounced. It is of great diagnostic importance here as it warns early of cholecystitis and cholangitis developing as a complication of typhoid, for example, and masked by the typhoid. The onset of infection in the bile apparatus is thus revealed by suddenly appearing urobilinuria. It is also valuable in revealing malignant metastasis in the liver, as neither gastric ulcer nor cancer induce it, not even with profuse hemorrhages, but it appears at once in an intense form if the liver becomes involved. Cirrhosis of the liver is also generally accompanied by intense urobilinuria and all affections of this organ injure its cells until they lose their avidity for urobilin.

Urobilinuria is also a consequence and sign of extravasation of blood; it was always pronounced in Feldner's cases of cerebral hemorrhage. It suggests that decompressive operations are contraindicated in dubious cases. Subcutaneous hemorrhages or hemorrhage into the stomach or bowels do not induce urobilinuria and neither does fever in itself. The liver disturbance that usually accompanies fever is responsible for the urobilinuria observed. As a sign of liver insufficiency, urobilinuria may afford useful information as to the resisting powers in contemplating an operation, especially with chloroform, which is peculiarly toxic for the liver.

Urobilinuria is also of great importance in anemias, as we know that if abnormal hemolysis is responsible for the anemia it must be treated by splenectomy, as tonics for the bone marrow, arsenic, etc., do not reach the cause of the anemia. In anemia of the chlorosis type there is not a trace of urobilinuria as there is so little blood formed. But in anemia from hemolysis, of the pernicious anemia type, urobilinuria is documentary evidence of the justification for splenectomy. The latter acts in two ways in cases of cirrhosis of the liver, both by checking the decimation of the blood corpuscles and by arresting the fatal process of further destruction of the liver parenchyma. Both of these pathogenic constituents of the hemolytic cirrhosis process induce pronounced urobilinuria, and hence it is particularly intense in these conditions. When catarrhal jaundice is accompanied by urobilinuria it suggests impending acute yellow atrophy; this develops from the interplay of hemolysis and autolysis of liver cells, and splenectomy rescues the liver; Eppinger has reported a successful case in which signs of acute yellow atrophy were already apparent. With this disease the liver is destroyed so utterly that no bile is produced and hence there is no urobilinuria. All diseases in which there is a hemolytic factor are generally accompanied by enlargement of the spleen and liver. With all tumors in the upper abdomen, consequently, tests for urobilinuria will disclose whether or not it is a question of the spleen-liver vicious circle to be broken up by splenectomy.

70. **Ovary Grafting.**—Benthin announces the conclusion from his study of the literature on transplantation of ovaries—seventy-three articles—that experience has justified the principle and given satisfactory results. Success depends in homoplastic grafting on the immediate transference of organs, as this has much to do with their nourishment later. For hemorrhage in the elderly, he thinks that hysterectomy or Roentgen exposures are better than ovarian grafting. It is still a question whether the latter has any promise in treatment of osteomalacia; other glands with an internal secretion may be involved as well as the ovaries. The main field for ovary implants is in prevention and treatment of the phenomena of the premature menopause. It must not be forgotten, however, that organ therapy has made such progress that deficit phenomena are growing rarer and less severe, at least in older women.

Correspondenz-Blatt für Schweizer Aerzte, Basel

July 3, XLV, No. 27, pp. 833-864

71 Experiences in Military Surgery. (Kriegschirurgische Erfahrungen und Beobachtungen.) H. Matti. Commenced in No. 25.

July 10, No. 28, pp. 865-896

72 Plasma Cells in Various Organs in Infectious Diseases. R. Hagiwara.

73 War and Medical Bibliography: The Medical Literature of the Four Years Including the Franco-Prussian War. M. Roch.

Deutsche medizinische Wochenschrift, Berlin

Aug. 27, 1914, XL, No. 35, pp. 1681-1704

74 Extra-Uterine Pregnancy. (Behandlung der ektopischen Schwangerschaft.) P. Jung.

75 Value of Wassermann Reaction. M. Rohde.

76 Amusia and Aphasia. O. Goebel.

77 Trauma of Skull and Lumbar Puncture. Hosemann.

78 Operative Cure of Fissure in Upper Bladder. (Blasenspalten.) L. Schliep.

79 Magnesium Sulphate in Tetanus. A. Falk.

80 Vaccination Against Typhoid and Cholera. W. Fornet.

June 24, XLI, No. 26, pp. 757-784

81 Treatment of Nervous Disturbances in Soldiers. (Lazarettbeschäftigung und Militärnervenheilstätte.) R. Wollenberg.

82 *Typhoid in Soldiers. P. Jacob.

83 Welfare Work for Blinded Soldiers. (Kriegsblindenfürsorge.) E. Krückmann. Concluded in No. 27.

84 *Evacuation of Stomach and Intestines in Condition of Atony. (Zur Frage der Magen- und Darmentleerung bei atonischen Zustanden.) H. Gross.

85 Improved Technic for Roentgen Tubes. (Das Glühventil nach Koch.) G. Holzknecht.

86 Technic for Plaster Orthopedic "Traps." (Gipsattrappe.) L. Mayer.

82. **Differentiation and Complications of Typhoid.**—Jacob and others have obtained positive results in 90 to 95 per cent. of all the cases of typhoid in which a beef-gall culture medium was inoculated with a few c.c. of the patient's blood. This differential method is particularly

reliable, as the findings are positive from the first day of the fever and until a few days before defervescence, and the test requires only from fifteen to thirty hours. About 5 c.c. of the culture medium (Endo or Drigalski-Conradi) are placed in a test tube and allowed to harden. Then 1.5 or 2 c.c. of sterilized beef gall is added to the second tube. On addition of 2 or 3 c.c. of blood from a typhoid patient to a tube thus prepared, the characteristic colonies can be seen in the tube in ten or fifteen hours, and, a few hours later, agglutination will confirm the diagnosis. The eosinophils disappear from the blood during the course of typhoid but begin to reappear as recovery progresses, finally representing 5 or 7 per cent. of the total leukocyte count. In his experience with 300 cases of typhoid in soldiers he found in a number of instances that it caused an old long-latent tuberculous or other focus to flare up anew. Pneumonia is so common as a complication of typhoid that he declares his conviction that 20 or 30 per cent. of all the deaths from typhoid are in reality due to pneumonia.

The fact should be more generally appreciated that typhoid is not a disease of the bowels. It is a general toxic disease involving the entire organism. The more this is realized and treatment applied accordingly, the better the results. Among the other practical points which he emphasizes is that vaccination against typhoid had better be done all on one side, for instance, the three injections made on the left side always, leaving the right side for inoculation against cholera, just as vaccination against smallpox is always applied to the arm. By this means we can know just where the man stands in regard to preventive vaccination. The men's statements about this were often vague and conflicting.

84. Treatment of Atony of the Stomach and Intestines.—Gross was disappointed at the results of the retention stomach tube introduced through the nose, according to Westermann's technic. Its introduction was distressing and the effect far from realizing expectations. So he resumed his practice of making a fistula into the stomach for siphon drainage which has always answered the purpose well in the thirty-five cases of peritonitis in which he has applied it, and also as a preliminary measure in acute pancreatitis, perforated empyema of the gallbladder, gunshot wounds, and mechanical ileus, a total of forty-seven laparotomy cases. The incision is made under local anesthesia on the median line or below the left costal arch. A small area of the serosa of the stomach is fastened with five to seven running stitches of fine silk to the parietal peritoneum, the stomach is incised, and a stout 1 cm. wide tube is introduced for 5 or 8 cm. into the organ, the tube connected with a vessel on the floor for siphon drainage. This draws up into the stomach fecal matters in the intestine farther along, so that the method clears out not only the stomach but part of the bowels. If the tube gets clogged it can be cleared by rinsing it from without. The patient can drink at once as much as he wishes. The psychic influence of this is very important for the thirst-tormented patient. The fluid rinses out toxic matters from both stomach and upper bowel. The effect of the siphon drainage from the stomach is more far-reaching than from a fistula into the bowel. The latter is sometimes required with mechanical hindrances, adhesions, etc., and may advantageously supplement the stomach fistula. He leaves the tube in the stomach until the bowels move and sometimes longer, closing it at times. The incision afterward is closed merely with adhesive plaster. In conclusion Gross declares that he can cordially commend this method of treatment to general practitioners from an experience of considerably over 200 cases in which he has made a simple gastric fistula.

Internat. Monatsschr. f. Anat. u. Physiol., Leipzig and Chicago

XXXI, Nos. 10-12, pp. 437-560. Last indexed April 10, p. 1279

87 *Functioning of the Pancreas and Its Relation to the Pathogenesis of Diabetes. A. Visentini.
88 *The Physiologic Destruction of Erythrocytes in Birds. P. Kyes.
89 Heat-Coagulation of Muscles of Northern and Southern Frogs. R. Hopkins and G. Mann (Tulane).

87. The Pancreas and Diabetes.—Visentini's article was awarded the Warren triennial prize at Boston in 1913. It fills over 100 pages and is accompanied by seven double-page plates, some of them colored. Its motto is da Vinci's, "Knowledge is the daughter of experience," and it is based on analysis of the literature on the subject and extensive personal experiments on twenty-seven dogs at the institute for pathologic anatomy at the University of Pavia. The final outcome confirms anew and apparently conclusively that the islands of Langerhans and these alone among the elements of the pancreas control the metabolism of carbohydrates in the animal organism.

88. Phagocytosis of Red Corpuscles in Spleen and Liver.—Kyes says that he noticed in the course of experimental research that certain fixed-tissue cells in the spleen and liver were constantly incorporating red blood corpuscles as a physiologic process. He gives the technic for the differential histologic method with which he apparently demonstrated this hemophagic action in the spleen and liver of the reptiles, amphibia and mammals examined under normal conditions. His attention was first called to it in the course of other research on healthy pigeons. A colored plate shows the various steps of the process.

Medizinische Klinik, Berlin

June 20, XI, No. 25, pp. 687-714

90 Trauma and Appendicitis. E. Schepelmann.
91 *Relations Between Somatic and Mental Disease. (Beziehungen zwischen körperlichen Erkrankungen und Geistesstörungen.) J. Enge. Concluded in No. 26.
92 Differential Diagnosis of Typhus. (Fleckfieber.) H. Wagener.
93 High Fatality of Abdominal Wounds, and Immediate Operative Treatment. (Zur Statistik der Bauchschüsse.) F. Rost. (Indikationen zur Laparotomie im Felde.) O. Strauss.
94 Treatment of Placenta Praevia by General Practitioner. P. Rissmann.
95 Guard to Protect the Hand Against Infection in Turning Faucets, Knobs and Keys. (Ein Infektionsschutzschlüssel.) A. Sawicki.
96 Dysentery. (Klinische Beobachtungen über Ruhr.) K. Schütze.

June 27, No. 26, pp. 715-740

97 Experimental and Clinical Research on Passage of Toxin and Antitoxin in Tetanus. (Die "Fibrillentheorie" und andere Fragen der Toxin- und Antitoxinwanderung beim Tetanus.) L. Aschoff. Concluded in No. 27.
98 Morbid Conditions in Internal Organs from Chronic Alcoholism and Their Influence on Fitness for Active Service. (Veränderungen an den inneren Organen infolge von chronischem Alkoholismus und ihren Einfluss auf die Felddienstfähigkeit.) G. Hoppe-Seyler.
99 Treatment of Wounds in War. (Kriegschirurgische Erfahrungen.) H. Oppenheim.
100 Remarkable Case of Nontropical Elephantiasis; Kondoleon's Operation. J. Strasser.
101 Symptomatology of Vaccination Against Typhoid. (Typhusschutzimpfung.) J. Löwy.
102 Reduction of Toxicity of Salvarsan by Dissolving in Serum. (Herabsetzung der Giftigkeit des Salvarsans durch Auflösung im Serum.) W. Roick.
103 Rabbit Typhoid Bacilli Carriers Cured by Tincture of Iodin Internally. O. Löwy.

91. Relations Between Mental and Physical Disease.—Enge relates that at necropsy of 248 insane patients he found physical affections responsible for the death in 80 per cent. The discovery of the intimate connection between bodily disease and mental disturbances he regards as a great achievement of modern psychiatry. The most familiar type of it is the initial delirium of typhoid; this may even mask completely the physical manifestations at first. He has had a number of persons brought to the detention hospital as insane who proved to be merely coming down with typhoid. The possibility of this should always be borne in mind when insanity develops suddenly, especially in the young. Typhoid with this early mania has proved fatal in 40 or 50 per cent. of such cases in his experience. In many cases of mental disturbance in the course of pneumonia, anthrax, erysipelas and influenza, the specific micro-organism induces a meningitis or encephalitis in the same way as in typhoid, which explains the clinical phenomena. More common than this, however, is the action of the disease toxin on the central and peripheral nervous system. In other cases the acute infectious disease is not the direct cause but merely throws down barriers and allows other elements a chance to work. The resulting brain trouble

is then quite independent of the somatic affection and the prognosis is usually less favorable.

Hypostatic and aspiration pneumonia formed 26.61 per cent. of the mortality at the Lübeck insane asylum during the last sixteen years. Sometimes the mental trouble seems to subside wholly or in part during or after some acute infection, such as erysipelas or typhoid, but in his experience the benefit has always been transient. Certain forms of mental disease, melancholia, stupor and dementia, seem to predispose to tuberculosis, and it develops in a severe form. This is easily explained by the lack of exercise, the shallow breathing and sluggish metabolism in such insane persons. The mental disease is the primary trouble. Some years tuberculosis formed over 40 per cent. of the total mortality in the asylum. He discusses the connection between constitutional diseases and mental disturbances, especially syphilis and cancer. In sixteen years at the Lübeck asylum cancer was responsible for only 3.44 per cent. of the mortality among the men and 5.82 per cent. among the women. In 248 cadavers from the asylum he found chronic nephritis in 45, pyelonephrosis in 4, fat degeneration in 7 and amyloid kidney in one case. Liver affections were quite rare and the gallbladder was found diseased only in 4 men and 14 women.

Morbid conditions in the heart were evident in 73.38 per cent. of the 248 cadavers. Strecker found pathologic changes in the heart in 61.7 per cent. of the men and 42.7 of the women in 1,000 cadavers from the Dalldorf insane asylum, and only 27 and 23 per cent. respectively in 1,000 cadavers of the noninsane. Acute and chronic psychoses entail irregular and defective eating and the secondary digestive disturbances aggravate the psychosis in turn. He reiterates in conclusion that there is nothing in clinical experience to sustain the assumption that psychoses can be induced by gynecologic affections. There is no evidence further that gynecologic disease is more prevalent among the insane than among others. Enge found the uterus or the ovaries or both diseased in only 7 of the 248 cadavers. In the puerperal psychoses, infectious processes play the greater rôle. In these and in the psychoses following the menopause, the cause is not to be sought in the changes in the genital sphere but in the general involution processes. In short, the roots of mental affections spread far beyond the confines of psychiatry.

Münchener medizinische Wochenschrift, Vienna

June 22, LXII, No. 25, pp. 837-872

104 Improved Tube for Roentgen Work. (Die gasfreie Röntgenröhre nach J. E. Lilienfeld. Erprobung und Anpassung ihres Betriebes an die praktischen Zwecke.) Holzknecht and others.
105 Rapid Transformation of Rabies Virus from "Street" to "Fixed" Form. A. Beham.
106 Potable Water Supply in West Flanders and Poland. Fürth and v. Scheurlen.
107 *Influencing the Circulation in the Skull by Twisting the Head Around. (Gestaltveränderungen einer Hirnwunde, durch Kopfdrehung hervorgerufen; Sternokleidostellung.) O. Muck.
108 Improvised Craniometer. (Einfache Projektion der Gehirnzentren auf die Schadeloberfläche ohne Kraniometer.) H. Matti.
109 *Consequences of Heat Stroke. (Folgezustände des Hitzschlags.) A. Bittorf.
110 Cholera. A. Weisskopf and H. Herschmann.
111 Apparatus for Mobilization of Stiff Joints. W. Engelhard, A. Nussbaum, S. Gara and J. P. Köhler.
112 Improvised Protheses. (Interimsprothesen.) A. Angerer.
113 Duration of Pregnancy. O. Möglich.

107. **Modification of Circulation Inside Skull by Twisting the Head.**—Muck calls attention to the change in the circulation of the brain when the head, held straight, is twisted around to the side. This compresses the internal jugular vein on that side while it expands the vein on the other side. His attention was called to it anew recently by the changes observed in the bleeding and secretions of gaping wounds in the skull when the head held vertically was twisted around over the shoulder. He was able to obtain sphygmographic tracings showing the modification in the circulation on both sides, one reduced and one augmented, especially with wounds of the skull with unopened meninges.

109. **Consequences of Heat Stroke.**—Bittorf has had a number of men under supervision for almost a year since they had heat stroke last August. He also has had a number of patients who had been sent back from the front on account of heat stroke. During the first few days the men complained mostly of headache and languor, with sometimes nervous tachypnea and weak voice. Then a few days later, the majority developed severe hysteric convulsions. True epilepsy was never observed, but the hysteric convulsions kept up, and not one is entirely free from them to date although the last one was discharged from medical oversight in April, 1915, as capable of garrison duty, and has improved since. There can be no doubt, he says, of the hysteric character of the rapid breathing and rapid pulse, abasia, astasia, stuttering, disturbances in gait and tetanoid attacks. One man has had tachycardia of 140, even in repose, unmodified during the nine months to date. Bittorf states explicitly that there can be no question of imitation in his cases, but all the severer forms of heat stroke were followed by hysteric sequels. A pronounced inherited nervous predisposition was evident in only one case; the man's mother was known to have suffered much from headache. No inherited taint could be determined in any other case. The relatively unfavorable prognosis is remarkable, he adds. In the one case with complete recovery—the abasia and stuttering finally subsiding—the patient was a volunteer soldier and Ph. D. As the prognosis is thus so unfavorable, the prophylaxis is doubly important.

Zeitschrift für Tuberkulose, Berlin

June, XXIV, No. 2, pp. 81-160. Last indexed July 24, p. 368

114 Importance of Cooperation of the Patient in the Cure. (Die cur hic.) G. Liebe.
115 Mechanical Predisposition for and Origin of Tuberculous Apical Disease. (Entstehung der tuberkulösen Lungenspitzenphthise.) C. Hart.
116 Tubercle Bacilli Not Often Found in the Blood with Pulmonary Tuberculosis. L. Brown, F. H. Heise and S. A. Petroff (Saranac Lake).
117 *Heliotherapy in Denmark. K. Schäffer.
118 Tuberculosis in Relation to the Eye, Ear, Nose and Throat. G. H. Kress (Los Angeles).

117. **Sunlight in Treatment of Tuberculosis.**—Schäffer relates that, at the instigation of Finsen, at the Vejlefjord sanatorium in Denmark sunbaths were introduced into the routine treatment of bone and lung tuberculosis as long ago as 1902. In the course of the years since, 364 patients have been given systematic heliotherapy, taking a total of 6,500 regular sunbaths. The duration is only five or ten minutes at first, gradually increasing to an hour. The other measures left no time for longer than this. The men's bath is from 12 to 1, the women's from 1 to 2 p. m.; a physician always takes the bath with the men and a nurse with the women. The method was never applied to patients with a tendency to hemoptysis or progressing pulmonary lesions. Of the 364 patients, 20 per cent. were in the first stage, 33 per cent. in the second and 46 per cent. in the third. No by-effects were noted except that some of the patients felt fatigued after the first baths, and that a few developed erythema to such a degree that the course had to be interrupted. No direct influence on the lung process was ever apparent, but now and then certain symptoms seemed to improve and the patients enjoyed the baths and seemed to feel refreshed after them. In some cases—three typical ones are described—the sunbaths seemed to be the prominent factor in the rapid and pronounced improvement. One young man in particular had had fever for a year, with bilateral pleurisy and swollen mediastinal glands. Under the heliotherapy the fever subsided in a month and the general health notably improved, when no measures before had induced any benefit. Another patient was a young man in the second stage of pulmonary tuberculosis with sequels of pleurisy. The pleuritic dullness disappeared almost completely in three months under the sunbaths, and this cannot be a mere casual coincidence. Recently the sanatorium has had halls equipped for artificial heliotherapy so as to be independent of the Denmark weather.

Zentralblatt für Chirurgie, Leipzig

June 26, XLII, No. 26, pp. 457-472

119 Silver Adhesive Plaster for Dressing Wounds. (Zur Frage der kriegschirurgischen Wundbehandlung.) C. Lauenstein.

120 Superiority of Silver Foil for Dressing Wounds. (Weitere Erfahrungen über die Verwendung von Silberplattchen in der Chirurgie.) M. Vogel.

Zentralblatt für Gynäkologie, Leipzig

June 26, XXXIX, No. 26, pp. 441-456

121 *Cure of Chronic Posterior Parametritis by Automatic Colpeurynter Massage Plus Fixation of the Round Ligaments. S. Holz.

121. Automatic Massage in Chronic Inflammation in the Pouch of Douglas.—Holz has the woman wear a ball in the posterior vagina. The ball is introduced empty and then filled with water, stopping just short of causing pain by distention. It is worn from one to three days, then removed, cleaned and replaced. As the woman breathes there is a gentle massage of the region and the results have been extremely good in his experience.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 20, XXXVI, No. 49, pp. 769-784

122 *Excision and Suture for Anal Fistula. G. Fantozzi.

123 Successful Removal of Hypernephroma from Otherwise Healthy Man of 48. G. Baglioni.

122. Anal Fistula.—The technic is described with which Fantozzi excised and sutured an anal fistula in fourteen cases, all but one healing by primary intention. The time required is shorter than by other methods of treatment, and no after treatment is necessary, the cure being complete and permanent in thirteen days at longest. Quénu and Hartmann say that five or six weeks are required to cure an anal fistula and Arsonneau had only fifteen cured among sixty treated by his method and from twenty to thirty-three days were required.

Policlinico, Rome

June 27, XXII, No. 26, pp. 853-892

124 *Differentiation of Blue Disease: Three Cases. (Il sintoma ascoltatorio del Bonardi per la diagnosi di pervieta del setto interventricolare cardiaco.) F. Giugni and E. Giovannini.

July 4, No. 27, pp. 893-924

125 Aspiration of Urine Through the Urethra in Acute Total Retention of Urine. F. de Meo.

126 The Roentgen Ray Truck in Military Service. (L'automobile radiologico nei servizi in guerra.) F. Ghilarducci.

124. Opening in the Interventricular Septum.—Giugni calls attention to the value of the auscultation findings in diagnosis of this congenital anomaly. Bonardi described as pathognomonic a systolic murmur synchronous with the murmur and rough transverse fremitus at the third costal cartilage. The murmur in question spreads upward from the clinical focus of the aorta and a little to the right, to the subclavicular fossa, and is still appreciable in the carotid, subclavian, and axillary arteries and their minor ramifications. It is the classic murmur with stenosis of the aorta, both clinical and anatomic. The maximum or starting point of the systolic murmur is at the body of the sternum at the point of attachment of the third left costal cartilage. It spreads obliquely upward toward the right margin of the sternum, then into the right second interspace and thence, below the clavicle, to the carotids. In Giugni's two cases he was unable to trace it into the subclavian or axillary arteries. At the same time another murmur was heard on the left side, deeper and of an almost musical tone. Both were systolic, synchronous, and of arterial origin, one originating in the stenosis of the pulmonary artery, the other from the passage of the blood from the hypertrophic right ventricle into the left and its propagation onward along the aorta. When there is some lesion of the pulmonary artery reducing its lumen, the interventricular septum does not close up as normally, the gap left being in the nature of a compensation for and necessary consequence of the anomaly in the pulmonary artery. The laws of propagation of sound can be traced in the spread of the resulting murmurs, as Giugni explains in detail. The two cases he describes were in children of about 3 and 13. Giovannini's patient was a woman of 38, and the clinical signs demonstrated unequivocally that the lumen of the pulmonary artery was abnormally small, while there was also a communication between the ventricles. The compensatory hypertrophy of the ventricles permitted almost normal functioning of the heart except under the influence of fatigue or emotions when serious attacks of dyspnea and distress in the heart region developed. The patient has been pregnant six times but abortion or premature delivery had been the outcome in five, although there was nothing except the circulatory disturbances to explain these miscarriages. Her attacks sometimes ended with hemoptysis, which Giovannini regards as a safety valve and not to be combated. She has one apparently healthy daughter, 10 years old.

Semana Medica, Buenos Aires

June 10, XXII, No. 23, pp. 719-746

127 *Simple Method for Extracting Foreign Bodies in the Esophagus. E. Ferreyra.

128 Cystic Transformation of Strangulated Omentocele. M. R. Moreno.

129 Technic for Procuring Specimens of Water, Urine, Milk and Sputum for Examination. B. S. Ondarra.

127. Foreign Bodies in the Esophagus.—Ferreyra uses a urethra catheter, No. 16 or 18, and half a yard of coarse silk, No. 3 or 4. He lubricates the catheter profusely with petrolatum, and introduces it gently into the esophagus three or four times. This mobilizes the foreign body, arrests the spasm and lubricates the passages. Then he winds the silk, previously moistened, around the lower third of the catheter, that is, for about 10 cm. from the tip. The catheter and silk are then lubricated anew, and it is introduced again into the esophagus, very gently. When it is felt that the tip of the sound has passed the foreign body, he twists the catheter until he feels a slight resistance and then draws it out, having the head bent forward a little, and still keeping his forefinger in the larynx. The foreign body generally comes out at the first attempt; if not, he repeats the procedure until it does.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 1, I, No. 18, pp. 1503-1586

130 Study of Stomach and Duodenum Functioning by Means of Duodenal Sound and Thread. B. Sybrandy.

131 Occult Blood in the Stools. (Het aantoonen van bloed in de ontlasting.) I. Snapper.

June 12, No. 24, pp. 2051-2118

132 *Circumscribed Meningitis; Diagnosis and Treatment. (Plaatselijke hersenvliesaandoening.) C. T. van Valkenburg.

133 Physiology of the Lacrymal Apparatus. (Bijdrage tot de kennis der physiologie der traanwegen.) C. E. Benjamins and G. F. Rochat.

134 The Benzidin Test for Occult Blood in Stools and Urine. (De benzidineproef voor bloedonderzoek in ontlasting en urine.) J. W. M. Indemans.

132. Circumscribed Meningitis.—Van Valkenburg reports four cases of this kind to illustrate the difficulty sometimes encountered in locating the exact site of the lesion. Even when there has been no local hemorrhage at the point where some injury befell the skull, there may be cicatricial changes enough to cause serious motor and sensory disturbance. There was a history of trauma only in one of his cases. In another a number of patches of calcification were found on the pia mater. Some were as large as a ten cent piece (Netherlands). They had grown to the surface of the brain and no attempt was made to remove them. Intervention was restricted to ligating some of the abnormally numerous and congested vessels. Prompt and regular improvement of the right paralysis followed, but local spasms in the right leg, arm, hand and face still occur often. Before the operation the man of 34 had had twenty-one general convulsions in the course of two years, but there have been none during the nine months since. The fundus findings are normal; before the operation there were signs of papillitis of the optic nerve. In this case there was a history of a blow on the head from a hammer, eight years before the first convulsions; no trauma was known in the

other cases, but the clinical picture was about the same in all. It seems evident from these cases and the others on record, that with motor or sensory phenomena suggesting a lesion in the anterior or posterior central convolution, the site is liable to be deep in or under the area of the cortex involved if the symptoms are persisting. If the symptoms are slight or are severe only after an epileptiform attack, then the lesion may be merely in the vicinity of the centers involved, or it may be outside the brain, located merely above the centers. On the other hand, with signs of papillitis of the optic nerve, with or without hemorrhages, and long before there is question of choked disk, and without other signs indicating abnormal pressure on the brain, an infectious process or abscess may be assumed.

Russkiy Vrach, Petrograd

Jan. 3, XIV, No. 1, pp. 1-24

135 Relations Between the Thyroid and the Sexual Glands. A. N. Mazikin.
136 Innervation of the Isolated Heart of Dog and Rabbit. N. G. Ponirovsky.
137 *Large Concrement in the Stomach. A. P. Grinenko.

Jan. 10, No. 2, pp. 25-48

138 Treatment of Relapsing Fever. B. P. Varipaieff.
139 Influence of Chloroform General Anesthesia on the Red Corpuscles. A. Z. Bilina and V. A. Shishoff. Commenced in No. 1.
140 Disorders of Female Pelvic Organs in Diabetes. N. K. Gogoberidze. Commenced in No. 1.
141 *Pathologic Anatomy and Symptomatology of Whooping Cough. M. V. Shiperovich.

Jan. 17, No. 3, pp. 49-72

142 Organization of the Care for the Wounded and Sick Soldiers. L. B. Bertenson.
143 Antiferment in Exudates and Transudates. J. A. Kudrin. Commenced in No. 2.
144 *Radium Treatment of Cancer. V. A. Polubinsky.

Jan. 24, No. 4, pp. 73-96

145 *Iodin Test for Functional Capacity of the Kidneys. M. N. Erofieva and V. A. Degtyareva. Commenced in No. 3.
146 *Umbilical Cord to Patch Gap in Dura. V. A. Perimoff.
147 Treatment of Wounded Joints in Field Ambulance. L. A. Rosen.
148 Varnish as Aid in Treatment of Wounds in War. I. A. Golanitzky.

137. Large Concrement in the Stomach.—Grinenko reports a case of a shellac concrement in the stomach, as large as a man's fist. Such stones are hard to diagnose as they may simulate a pyloric cancer, an omentum tumor, a floating kidney, or a tumor of the transverse colon. The only subjective symptom was pain in the epigastric region. The Roentgen findings differ from those usually found with a gastric cancer. The concrement consisted of shellac and was due to drinking varnish on account of its alcohol content. The alcohol was absorbed, leaving the shellac as a hard mass.

141. Clinical Forms of Whooping Cough.—Shiperovich reports four cases of whooping cough with unusual clinical manifestations. In one there were acute emphysema of the lungs, emphysema of the entire skin of the body, head and extremities and pneumothorax, the case terminating fatally from rupture of some alveoli in the lungs. In the second case the attacks of coughing were followed by unconsciousness; necropsy showed hemorrhagic encephalitis and pulmonary edema. In the third case the unconsciousness, clonic convulsions and glycosuria were probably caused by capillary hemorrhage in the fourth ventricle. The glycosuria disappeared afterward, and the patient recovered. In the fourth case, bloody tears showed during the cough. They contained numerous lymphocytes. This child also recovered.

144. Radium Treatment of Cancer of the Uterus.—The radium gave good results in the hands of Polubinsky. In 23 cases, 9 gave complete recovery; of these, 2 were operable cases, and 7 inoperable. In the remaining 14 cases a complication developed in one, namely, a rectovaginal fistula. In 6 there was a relapse after temporary improvement. No benefit was apparent in 3 cases; one patient died during the treatment. The others gave dubious results or the outcome is not known. The cases of apparently complete cure were under observation for from eight to twelve months from the beginning of treatment.

145. Iodin Test for Functional Capacity of the Kidneys.—Erofieva studied the elimination of iodin by the kidneys and salivary glands in healthy persons and in patients with acute or chronic nephritis. In 8 healthy persons the duration of elimination of iodin in the urine ranged from twenty and one-half hours to forty-nine hours; in the saliva, from twenty-three to thirty hours. That is to say that the urine was eliminating this substance fully nineteen hours longer than the saliva. Just the opposite was observed in nephritis; in 27 cases of acute and chronic nephritis, the presence of iodin in the urine could be determined during twenty-three up to one hundred and nineteen hours, while in the saliva the findings were positive from twenty-eight to one hundred and eighty-nine hours. In the urine of healthy persons, the iodin appears in the urine from twenty to fifty-three minutes after taking 0.5 gm. potassium iodid; in the saliva, from three to twenty-six minutes. In nephritis it appears in the urine in about fifteen minutes to two hours and forty minutes, and in from four to twenty-nine minutes in the saliva. It is evident that the duration of iodin elimination by the kidneys does not indicate the condition of the renal epithelium, since other organs, such as the salivary glands, participate in the same function and the iodin may be found for a longer period in the saliva than in the urine.

146. Umbilical Cord in Plastic Surgery for Dura Defects.—To cover defects in the dura mater various kinds of tissues have been used, fascia, fat, skin and peritoneum, but as they all form adhesions to the brain tissue proper, when the pia is injured, Perimoff determined experimentally on dogs the value of the umbilical cord for this purpose. The cord was taken from the lying-in hospital, from seventy minutes to eighty-five minutes elapsing between the time of severing the umbilical cord and its transplantation. An opening in the skull, dura and pia was made, the cord slit in the middle and the everted smooth surface was fitted into the opening toward the brain and sutured to the edges of the bone. Then the skin and bone flap was turned over back into place and sutured. Of the three dogs one died, one was killed a month later, and the other two months after the operation. The transplanted tissue did not adhere to the brain tissue in any instance. It looked macroscopically like a normal dura, and microscopically like connective tissue covered in places with foci of round cell infiltration.

Norsk Magazin for Lægevidenskaben, Christiania

July, LXXVI, No. 7, pp. 857-888

149 *Sacral Anesthesia. P. Bull.
150 Angioma of the Choroid in Youth of 17. S. Hagen.
151 Plastic Operation for Adamantoma in Lower Jaw. S. Widerøe.
152 Management of Transverse Presentation. (Om tverleiets behandling.) Drejer.

149. Sacral Anesthesia.—Bull applies this term to injection of a local anesthetic into the sacral canal, the same technic which Cathelin calls "epidural" and Läwen "extradural" anesthesia. Läwen in 1910 began the systematic application of Cathelin's epidural technic (1901), and Bull has applied it sixty-four times, the patients ten women and forty-six men. He injected through the dorsal hiatus 20 c.c. of a 2 per cent. solution of novocain plus epinephrin. The result was ideal in 47 cases but in 15.6 per cent. of the cases no anesthesia was induced. In the 54 cases with positive results no complications were noted in 46; in 2 there was slight bleeding from the sacral canal and in 6 transient pallor, vertigo, clamminess, palpitations and rapid pulse. These symptoms occurred so immediately after the injection and subsided so rapidly that they can scarcely be ascribed to absorption of the drug. The fully anesthetized region included the anus and lower rectum, perineum, urethra and lower part of the prostate, the scrotum but not its contents, as the latter are innervated from the lumbar segment of the spinal cord, the external genitals and vagina, and the penis. He gives a number of illustrations to show the exact technic. Läwen advises against the use of the sacral method for the elderly, but Bull found it particularly advantageous for them. The obese, the very nervous, the hysteric and children do not take local anesthesia of any kind well.